The politics of governing ‘system innovations’ towards sustainable electricity systems

Florian Kern

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SPRU - Science and Technology Policy Research
University of Sussex

I hereby declare that this thesis has not been, and will not be, submitted in whole or in part to another University for the award of any other degree.

Signature: ……

Florian Kern

UNIVERSITY OF SUSSEX

Florian Kern, DPhil in Science and Technology Policy Studies

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Summary

Electricity production and consumption are at the heart of modern life and are therefore of great interest to public policy. Threats such as security of supply concerns, the volatility of fuel and electricity prices, and especially environmental concerns like climate change, are putting increasing pressure on current electricity systems. One key response by governments has been support for innovation. It is widely acknowledged that electricity systems will have to change fundamentally in order to deliver on political goals. This will require deep cuts in greenhouse gas emissions. Incremental change along established technological trajectories is unlikely to be sufficient. Instead 'system innovations' have been suggested as a solution by scholars and policy makers. What are the politics of such an endeavour?

To answer this question this thesis looks at two distinct policy initiatives to promote more sustainable electricity systems: the 'Energy Transition' project in the Netherlands and the 'Carbon Trust' in the UK. While the aim of the two policy initiatives is similar, they try to tackle the challenge in very different ways. The analysis is based on semi-structured interviews as well as a review of documents and secondary literature and follows a process tracing method, combining within-case and cross-case analysis. By utilising a framework based on 'discursive institutionalism' (as per Hajer and Schmidt) the study aims to shed light on the importance of both discourses and institutional contexts in shaping policy initiatives to promote 'system innovations'. It demonstrates the mechanisms by which particular framings of the problem, expressed through new storylines, come to legitimate particular government policies. It emerges that existing institutions not only shape which storylines are politically acceptable but also constitute tangible features of the organisational and technical environment which those initiatives must change. In conclusion, the thesis argues that the politics of governing 'system innovations' can usefully be conceptualised and explained by struggles about meaning. These are shaped in turn through discursive interactions between actors as well as existing institutions. By highlighting the interplay between discourses, interests and institutions, the results provide an input to scholarly debate and policy making alike, in ways that offer to help inform the rethinking of strategies for fostering socio-technical 'system innovations'.

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List of Abbreviations

ACBE	Advisory Committee on Business and the Environment
ACE	Association for the Conservation of Energy
AER	General Energy Council (in Dutch: Algemeen Energie Raad)
BEEF	British Energy Efficiency Federation
BIS	Department for Business, Innovation and Skills
BMU	German Federal Ministry for the Environment
BSE	Bovine spongiform encephalopathy (mad-cow disease)
CBI	Confederation of British Industry
CCL	Climate Change Levy
CCGT	Combined Cycle Gas Turbine
CCS	Carbon Capture and Storage
CCT	Competence Centre Transitions
CEO	Chief Executive Officer
CHP	Combined Heat and Power
CO_2	Carbon Dioxide
CRC	Carbon Reduction Commitment
CT	Carbon Trust
DBERR	Department for Business, Enterprise and Regulatory Reform
DECC	Department for Energy and Climate Change
DEFRA	Department for the Environment, Food and Rural Affairs
DETR	Department for Environment, Transport and the Regions
DTI	Department for Trade and Industry
ECN	Energy Research Centre of the Netherlands
EOS	Energy Research Subsidy Scheme (in Dutch: Energie Onderzoek Subsidie)
EST	Energy Saving Trust
ET	Energy Transition
ETF	Environmental Technology Fund
ETI	Energy Technology Institute
ETS	Emission Trading Scheme
EU	European Union

EZ	Dutch Ministry of Economic Affairs (in Dutch: Ministerie van Economische Zaken)
FIT	Feed-in tariff
GDP	Gross Domestic Product
GHG	Greenhouse Gases
ICIS	International Centre for Integrative Studies, University of Maastricht
IEA	International Energy Agency
IP	Intellectual Property
IPCC	International Panel on Climate Change
IPE	Interdepartmental directorate Energietransitie
IPPR	Institute for Public Policy Research
kWh	Kilowatt hour
LTVE	Long-Term Energy Vision (in Dutch: Lange Termijn Visie Energie)
MEP	Electricity Generation Environmental Quality (in Dutch: Milieukwaliteit Elektriciteitsproductie)
MERIT	Maastricht Economic Research Institute on Innovation and Technology, Maastricht University
MP	Member of Parliament
MtC	Million tonnes of Carbon equivalent
NAO	National Audit Office
NEPP	National Environmental Policy Plan
NGO	Non-Governmental Organisation
NIDO	Dutch National Initiative for Sustainable Development (in Dutch: Nationaal Initiatief Duurzame Ontwikkeling)
OECD	Organisation for Economic Cooperation and Development
Ofgem	Office for Gas and Electricity Markets
POST	Parliamentary Office for Science and Technology
PV	Photovoltaic
RCEP	Royal Commission on Environmental Pollution
R&D	Research and Development
RD&D	Research, Development and Demonstration
RO	Renewables Obligation
RSPB	Royal Society for the Protection of Birds

SER	Social and Economic Council of the Netherlands (in Dutch: Sociaal-Economische Raad)
SMEs	Small and Medium Enterprises
STD	Sustainable Technological Development (Dutch abbreviation: DTO)
STS	Social-Technical System
TFE	Taskforce Energy Transition
TM	Transition Management
TNO	Netherlands Organisation for Applied Scientific Research
TSB	Technology Strategy Board
UK	United Kingdom
UKR	Unique Chances Subsidy Scheme (in Dutch: Unieke Kansen Regeling)
US	United States of America
WBCSD	World Business Council on Sustainable Development
VROM	Dutch Ministry of Housing, Spatial Planning and the Environment

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Florian Kern
Brighton, September 2009

1 Introduction: The challenge of transforming electricity systems into more sustainable configurations

This thesis analyses two policy initiatives aimed at sustainable transformations in socio-technical systems: the 'Energy Transition' in the Netherlands and the 'Carbon Trust' in the UK. In studying the governance of aspiring sustainable transformations, the thesis draws upon science and technology studies and political science, and is intended for those audiences, as well as being of interest to policy makers and stakeholders concerned about sustainable transformations.

This introductory chapter will discuss the attention given to large-scale, long-term structural change in socio-economic systems by scholars as well as policy makers interested in sustainability. Such 'system innovations' are interesting because they might offer inherently more environmentally benign systems. The focus is on one particular type of such system: electricity. The chapter explains why electricity systems are considered to be in need of fundamental change, how fostering innovation has been a key response to climate change and why a focus on technological innovation alone is insufficient. It then adopts the broader notion of 'system innovations' and discusses two policy approaches designed to stimulate such broader changes. It concludes by outlining the research questions that this thesis will answer.

1.1 Electricity systems: in need of change

Electricity is a key part of life in modern societies. It underpins numerous everyday activities from cooking to leisure activities, it powers manufacturing processes, enables all modern information and communication technology applications and is universally available in developed countries. Electricity has come to be taken for granted in industrialised societies (see Patterson 1999; Hofman 2005; Scrase, Wang et al. 2009). It has transformed the way people live: "In only a century, electric light and the systems that provide it have altered the course of human history. Electric light, electric motors,

electronics and other manifestations of electricity make modern industrial society possible" (Patterson 1999: 1).

Over the last decade, however, it has become widely acknowledged by researchers, policy makers and stakeholders that electricity systems[1] need to change substantially to cope with a number of challenges. Threats concerning security of supply, the volatility of gas, oil and electricity prices and especially environmental concerns about carbon dioxide emissions causing climate change are placing current electricity systems under serious pressure.

Policy makers are concerned about the increasing dependency of many OECD countries on imports of oil and gas from a few "politically unstable countries with undemocratic constitutions" (Müller-Kraenner 2008: 1), predominantly in the Middle East, Central Asia and Russia. The UK, for example, is developing a portfolio of policy initiatives to avoid dependency on particular nations in order to ensure it can retain independence in its foreign policy (Wicks 2009). It is often hoped that a "shift toward low-GHG power generation could both ease energy security concerns and reduce GHG emissions in this sector" (WBCSD 2007: 13). The reliability of domestic natural gas infrastructure is also a particular concern in the UK (Stern 2004).

While energy security concerns are often about the physical availability of for example oil or natural gas, there is also an economic issue in terms of the volatility of fossil fuel prices. There are a growing number of uncertainties about oil and gas imports in terms of both quantity and price. This volatility is of concern because, as Awerbuch and Sauter have pointed out, "oil price increases and volatility dampen macroeconomic growth by raising inflation and unemployment and by depressing the value of financial and other assets" (Awerbuch and Sauter 2006: 2805). They argue that an increased reliance on renewable energy technologies helps to decrease significant GDP losses due to the effects of this price volatility.

[1] I loosely define the electricity system as the infrastructure (physical as well as governing rules) and the actors who enable the supply and demand of electricity in a defined geographical space, e.g. a country.

Climate change is one of the most pressing environmental problems of our times and has attracted enormous worldwide public and policy attention over recent years. Carbon dioxide emissions from electricity generation are a major contributor to climate change. According to the Stern report, electricity generation contributes about 24% of worldwide GHG emissions (Stern 2006b). As the Royal Society has argued recently, one urgent priority for immediate action is therefore to decarbonise electricity supply (Royal Society 2009).

These challenges are widely acknowledged by stakeholders such as the European Renewable Energy Council and Greenpeace (EREC and Greenpeace 2008), business actors such as the World Business Council on Sustainable Development or the World Energy Council (WBCSD 2007; World Energy Council 2007) as well as academics (e.g. Reiche and Bechberger 2006; Patterson 2007; Mitchell 2008; Scrase and MacKerron 2009).

While the above-cited sources may emphasise different reasons with varying degrees of importance, the overall picture is that there is a strong and widely shared understanding that electricity systems need to change substantially over the coming decades. Furthermore, policy makers increasingly accept that energy systems have to change dramatically if they are to deliver desired political goals for deep cuts in carbon emissions in the magnitude of 60 or 80%, and that electricity supply and demand will have to play a key role in this. Electricity generation is one of the main sources of carbon emissions and thus the ‘greening’ of electricity supply has been at the heart of governments’ responses to climate change.

The following section will detail the particular emphasis that is put on innovation and technological change to tackle climate change by ‘greening’ electricity supply and demand.

1.2 Innovation, technology and climate change

Fostering innovation is a key policy response in mitigating climate change and making electricity systems more sustainable. As part of the International Panel on Climate

Change's (IPCC) Fourth Assessment report in 2007, working group III in their report on *Mitigation of Climate Change* emphasised that:

> "The cost and pace of any response to climate change concerns will also depend critically on the cost, performance, and availability of technologies that can lower emissions in the future. These technologies include both end-use (demand) as well as production (supply) technologies. Technological change is particularly important over the long time scales characteristic of climate change" (IPCC 2007a: 147).

The report argues that because of two related market failures government policies need to play an important role in stimulating technology development and diffusion. The first market failure is that firms are often unable to appropriate the benefits of technology development because of spillover effects, which leads to underinvestment in R&D from the private sector. The second is the failure to sufficiently internalise the social costs of carbon emissions into market prices, which reduces the demand for low carbon technologies and thereby also reduces private sector investments (see for example Foxon 2003; IPCC 2007a; Watson 2009). The IPCC argues that to stabilise carbon emissions a portfolio of technologies needs to be developed and commercialised through appropriate and effective incentives for the "development, acquisition, deployment and diffusion of technologies and for addressing related barriers" (IPCC 2007b: 16).

Also, the widely cited Stern review on the economics of climate change notes that because of the above-mentioned market failures there is:

> "a strong case for supporting the development of new and existing low-carbon technologies, particularly in a number of key climate change sectors. The power of market forces is the key driver of innovation and technical change but this role should be supplemented with direct public support for R&D and, in some sectors, policies designed to create new markets. Such policies are required to deliver an effective portfolio of low-carbon technologies in the future" (Stern 2006a: 373).

Similarly, despite generally being in favour of non-intervention and market-based instruments, the IEA also argued recently for government leadership in fostering innovation and deployment of new energy technologies to address climate change. It advocated a coherent technology strategy supported by a mix of policies to stimulate research,

development, demonstration and deployment in line with energy policy objectives (IEA 2007: 176).

Technological change and innovation is believed to play a major role in tackling long-term carbon emission reduction targets because "[t]echnological change supports all the hopes for painless reduction in GHG emissions" (Thalmann 2007: 5263). Technological change is seen as a possibility for decoupling economic growth from fossil fuel emissions. Technology is also hoped to make achieving emission reduction targets cheaper: "Achieving deep reductions in greenhouse gas (GHG) emissions at acceptable social costs will involve far-reaching technological change in the energy and in other sectors" (Grubb 2005: 103). Pacala and Socolow have argued that the widespread deployment of a portfolio of existing technologies could solve climate change (2004).

It is also hoped that technological change and innovation will contribute to policy goals other than tackling climate change, e.g. increasing security of supply. In their introduction to a recently edited book *Innovation for a Low Carbon Economy*, Foxon et al. point out that "[i]nnovation in energy systems will provide a core contribution to achieving national and international energy policy goals, including energy security and long-term reductions in carbon dioxide (CO_2) emissions" (2008: 1). Others agree that "technology is generally viewed as the answer to many energy challenges – supply, security, environmental stewardship" (Kenderdine and Moniz 2005: 425).

Policy documents often stress that innovation and technological change is important in tackling climate change. For example the UK 2007 White Paper on energy policy postulates that:

> "Our move to a secure and low carbon economy requires the development of technologies, products and processes to reduce the carbon emissions from energy. We need to harness cleaner sources of energy, such as wind, waves and tides, and find ways to decarbonise fossil fuels, including through more efficient production and use. We also need skilled people to develop, install and operate these technologies. Without these developments we will be unable to meet our carbon reduction goals and we will have fewer sources of energy to rely on within our energy mix" (DTI 2007: 216).

The US Government also acknowledged the need for technological innovation in tackling climate change as part of the 2005 Climate Change Technology Programme:

> "Given sufficient effort, time and motivation, aided by visionary leadership, international cooperation, and well-guided research, technological innovations could contribute significantly to this long-term objective [significantly reducing GHG emissions], and at the same time promote global economic development and prosperity. Analyses documented in the literature show that accelerated advances in technology have the potential, under certain assumptions, to significantly reduce the cost of mitigation over the course of the 21st century, compared to what would otherwise be the case with usual advances in technology. These technologies will create many new opportunities for both reducing GHG emissions and promoting economic growth" (U.S. Department of Energy 2005: 9).

Even the US Government, which did not in the past show substantial commitment to climate change targets, acknowledged the importance of innovation as a way to promote economic growth and reduce GHG emissions at lower costs. Along similar lines the German Government sees policy support for innovation, market diffusion and the international availability of new technologies as a central response to rising carbon emissions (BMU and BMBF 2008: 46). The German Government also emphasises that only innovation allows the possibility of combining economic growth with climate and environmental protection.

The discussion above shows that technology as a solution to climate change has become a commonplace in the literature on climate mitigation policy as well as in policy documents. Innovation will advance these technologies. But what exactly do we mean when we say that innovation is important? The following section will clarify how innovation can be defined and will differentiate between different types of innovation.

1.2.1 Innovation: more than new products and processes

Innovation in a broad sense can be understood to refer to "the production, diffusion and use of new and economically useful knowledge" (Foxon, Kohler et al. 2008). Innovation is

often understood as the development of new products or processes at the firm level (see e.g. Tidd, Bessant et al. 2005). However, scholars have also distinguished between several forms of innovation which differ according to their 'radicalness', type and scope. In their taxonomy of kinds of innovations Freeman and Perez (1988) distinguish between:

(1) Incremental innovations (improved products and services, which do not usually come about through deliberate R&D activity but through 'learning by doing' and 'learning by using'; incremental innovations rely on continuous innovation);

(2) Radical innovations (which are radically new and thus discontinuous and often combine product, process and organisational innovations; usually result from deliberate R&D efforts);

(3) Changes of 'technology system' ("far-reaching changes in technology, affecting several branches of the economy, as well as giving rise to entirely new sectors. They are based on a combination of radical and incremental innovations, together with organisational and managerial innovations affecting more than one or a few firms", p. 46; they are technically and economically interrelated), and

(4) Changes in 'techno-economic paradigm' (a new technology system or a number of technology systems which have pervasive effects throughout the whole economy; entail transformation of social and institutional framework; combination of interrelated product, process, technical, organisational and managerial innovations; "deep structural change in the economy", p. 59).

This taxonomy is useful as it helps to distinguish between different types of innovation and thus helps to overcome the focus on firm-level processes of innovation or particular product innovations. Freeman pointed out that attention needs to be focussed on not only individual firms, innovations or products but on

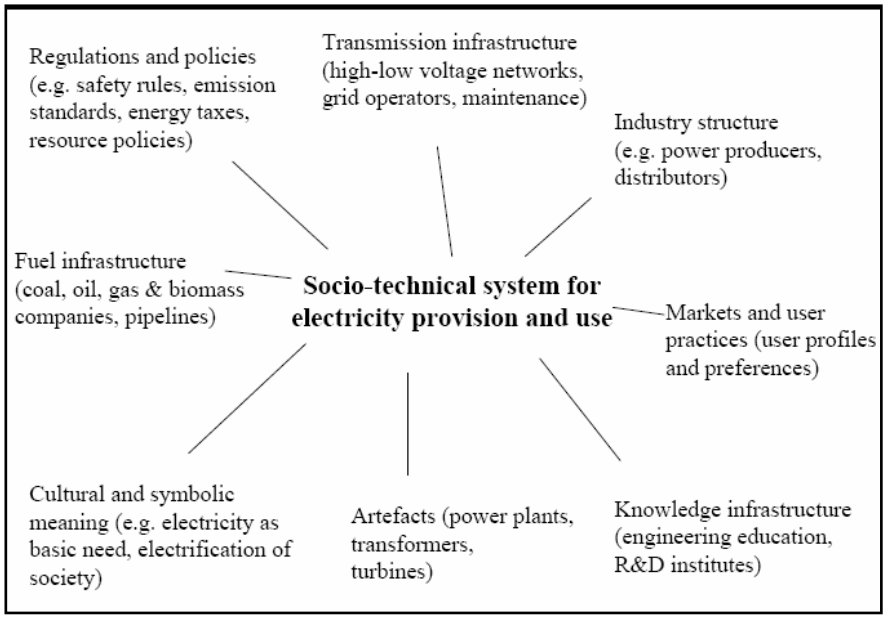
> "clusters of related innovations with a potential to affect a very broad range of products and processes and even the economy as a whole, such as electricity… The concern here is with the complementarities and externalities of families of interrelated technical, organisational and social innovations and with the rigidities of the built and institutional environments and established technological systems" (Freeman 1992: 132).

This perspective on innovation broadens the focus of the discussion above where most contributions pointed to the need for specific technological innovations and thus underplayed or did not distinguish between many of the different forms of innovation pointed to by Freeman and Perez. Different types of policy are likely to be needed to support different types of innovation, e.g. changes of technology systems might require support for R&D and coordination of actors as well as creating market signals.

1.2.2 'System innovations'

There has been a tendency in science, technology and innovation studies more broadly to go beyond the firm and the sectoral level of analysis. Socio-technical systems have become a focal unit of analysis (Smith, Stirling et al. 2005). Focussing on systems recognises that firms and technologies are embedded within wider social and economic systems. Central to a socio-technical system is the provision of a societal function such as transportation, housing or heating. These systems can be defined as "the linkages between elements necessary to fulfil societal functions" (Geels 2004a: 900). Socio-technical systems are conceptualised as clusters of aligned elements, such as technical artefacts, knowledge, markets, regulation, policies, cultural meaning, rules, infrastructure, etc (see Figure 1).

Figure 1: The socio-technical system for electricity provision and use



Source: (Hofman 2005: 74)

Change in such systems is based on mechanisms of co-evolution in society and technology (see e.g. Geels 2004a). This literature investigates how change in socio-technical systems occurs: the patterns and dynamics which may lead to 'system innovations', meaning

structural transformations of these systems (Rip and Kemp 1998; Geels 2004a; 2004b; 2005a; 2005b). A "system innovation can be understood as a change from one socio-technical system to another" (Geels 2004b: 19).

The concept of 'system innovation' in socio-technical systems seems to fall somewhere between category 3 and 4 of Freeman and Perez's taxonomy cited above: it includes far-reaching changes in technology and might give rise to new sectors; includes technical, organisational and managerial innovations, both radical and incremental; affects more than a few firms; includes social and institutional change but does not necessarily transform the whole economy: rather it transforms the way in which a certain socio-technical system fulfils societal needs. The focus of the 'system innovation' concepts is wider in that it focuses on not only the economy and firms but also on other societal actors (users, NGOs, public authorities, research institutes) (Geels 2004a). This is important as it has been claimed that multiple actors are involved in 'system innovations' through interactions between firms, suppliers, universities and knowledge institutes, public authorities, interest groups and users (Geels, Elzen et al. 2004: 5).

Recent thinking on system-level developments presents an alluring potential solution to problems of sustainability. Scholars interested in sustainable development have fundamentally questioned whether incremental change along established technological trajectories will be sufficient to meet such goals or whether 'system innovations' will be needed (Kemp 1994; Berkhout 2002; Unruh 2002; Geels, Elzen et al. 2004; Jänicke 2004; Weber 2005; Tukker and Butter 2007). A variety of scholars have convincingly argued that structural change is necessary: "It is not marginal or incremental changes that are needed for sustainability, but rather major product, process, and system transformations" (Ashford 2005: 159). Foxon (2003) has argued that policy needs to address system failures (meaning structural and institutional barriers) rather than only market failures if the long-term carbon emission reduction targets of the UK 2001 White Paper goals are to be met. Based on a review of the innovation systems literature he argues that policies to correct market failures do not address 'system failures' in the energy innovation system for low carbon technologies. His review points out that the evidence showed that learning beyond market

transactions and prices is important, that innovation is often a networked activity between users, producers and technology developers, and that the institutional set-up is important. This thinking is thus very much in line with calls for ‘system innovations’.

In particular, the transition to a low carbon economy will also require “far-reaching changes in the institutions, processes, priorities and substance of policymaking” (Scrase, Wang et al. 2009). A low carbon economy is not just about technological fixes: the wider political, economic and social context also needs to be addressed, as the Royal Society has recently argued (Royal Society 2009). The challenge for policy is to transform socio-technical systems into more sustainable configurations (Berkhout 2002).

If such ‘system innovations’ to make electricity more sustainable are the normative policy goal, how then do governments engage with this challenge?

1.2.3 Policy approaches to foster innovation

Below, a number of policy approaches which have been used to foster innovation will be discussed. These approaches are not of course mutually exclusive and in reality a mixture of these approaches has often been used. They are treated separately for reasons of analytical clarity.

- regulatory approaches

Governments have used regulatory instruments to either phase out certain polluting products or activities or to set certain minimum standards (e.g. best available technology) to influence the environmental impacts of products and production processes. Other regulatory instruments set minimum quality levels for specific media (e.g. air, water, waste regulation). One point of critique about traditional ‘command and control’ regulation has been that it proved inflexible and costly, underutilised economic instruments and focussed on end-of-pipe technologies rather than on cleaner technologies (Ashford 2005). Others

point out that the main shortcomings of direct regulation from the perspective of stimulating industrial transformation are that those policies shift pollution from one media to another rather than eliminating pollution, constrain innovations and reinforce an adversarial relationship between public, private and non-profit actors (de Bruijn and Norberg-Bohm 2005).

However, recent literature on environmental innovation policy has highlighted the role of governments in stimulating clean(er) innovations beyond traditional regulatory approaches: there is a large literature by ecological modernisation theorists who share the assumption that it is possible to reconcile economic development and environmental improvement by technological innovations (Hajer 1995; Cohen 1997; Weale 1998; Mol 2000; Murphy and Gouldson 2000; Mol 2003; Jänicke 2004; Sutton 2004; Jänicke and Jacob 2005; Cohen 2006). These scholars have studied the innovation and diffusion of marketable clean(er) technologies and have identified obstacles, such as market failures, which need to be addressed by government interventions.

It has been argued that ‘smart regulation’ is a key driving force behind environmental innovations by creating or supporting markets for domestic industries. Most famously, Porter argued that well-designed regulation might lead to innovation and increased competitiveness (Porter and van der Linde 1995). For example, dynamic energy-efficiency standards, as in Japan’s Top Runner Programme, “seems to be the most advanced and sophisticated approach to ‘ecological modernisation’” (Jänicke 2008: 560). In this programme, the Japanese Ministry of Economy, Trade and Industry regulates 21 energy-consuming products and the ‘top runner’ in energy efficiency subsequently becomes the basis for the next mandatory standard for national producers and importers in a certain target year. Before this deadline a ‘naming and shaming’ approach is used to incentivise laggards. Jänicke claims that the fulfilment of the standards is generally very positive and that producers confirmed increased competitiveness of their products. It has been argued that such regulatory measures can lead to first-mover advantages and create lead markets (Jänicke 2005a).

However, there is a discussion in the literature more broadly as to whether regulation leads to radical or 'really new' innovation or just to incremental improvements (Beerepoot and Beerepoot 2007). The IPCC points out that regulation and standards "may not induce innovations and more advanced technologies" (IPCC 2007b: 19)[2]. More importantly, this approach focuses on individual clean(er) technologies or processes, not whole systems. Indeed, even proponents of ecological modernisation policies admit that this policy approach reaches its limits when it comes to structural change (Jänicke 2004).

- market-based approaches to foster innovation

Market-based approaches rely on providing economic incentives for entrepreneurs, and supportive institutional frameworks (e.g. IP protection) as well as incentives for consumers to make the 'right' consumption choices. A key element in decarbonising the electricity supply using market-based instruments is the EU emissions trading scheme which tries to incorporate the social costs of carbon emissions into fossil fuel generated electricity and thus address one of the market failures mentioned above. However, it has been criticised in that:

> "getting the prices right will help, but it will only address market imperfections, not the fact that for some problems, such as global warming, even a perfectly working market is insufficient to address the problem – because of both the disparate time horizons over which present costs and future benefits are distributed, and because equity concerns are not adequately reflected in market decisions" (Ashford 2005: 162).

Reviews of current UK policy have suggested a more active role for the government in the development and deployment of low carbon technologies. Although generally commending the UK on its commitment to non-intervention and the use of market-based instruments, the International Energy Agency (IEA), in its last review of UK energy policy, criticised the fact that

> "the market-based policies have not ensured innovation and deployment of new energy technologies to address the long-term challenges facing the UK. Within

[2] Nevertheless, such instruments are useful as they help the diffusion and adoption of new technologies.

> existing frameworks, market actors have tended to pick mature cost-effective energy technologies like CCGT, landfill gas and wind" (IEA 2007: 176).

Market approaches are thus important in incorporating the social costs of carbon into decision-making processes but are not on their own sufficient for achieving more sustainable electricity systems.

- target approach

This approach to fostering innovation relies mainly on setting ambitious targets to increase commitment by stakeholders and the government to achieving, for example, lower emissions over a specified time period. One recent example is the Climate Change Act in the UK, which stipulates that carbon emissions need to be cut by 80% from 1990 levels by 2050. It is hoped that innovation will contribute substantially to this goal (DEFRA 2007). On the international level the Kyoto protocol has a similar function in setting future emissions targets, although the time horizon is much more limited. The IPCC argued that the emissions-based targets are hoped to induce long-term technology innovation based on two effects:

> "The first is that the anticipation of future targets, based on a so-called announcement effect, will stimulate firms to invest in research and development and ultimately to invest in advanced, currently non-commercial technology (the credibility and effectiveness of this effect, however, being challenged by Montgomery and Smith, 2005). The second is that early investment, perhaps through incentives, mandates, or government procurement programmes, will initiate a cycle of learning-by-doing that will ultimately promote innovation in the form of continuous improvement, which will drive down the cost of future investments in these technologies" (IPCC 2007a: 157).

One example of a concrete instrument using a target approach is the renewables obligation in the UK, which puts an obligation on electricity suppliers to source a certain percentage of their electricity from renewable energy (Turkenburg 2002; Mitchell and Connor 2004). This instrument is also linked to market-based instruments in that the obligations are tradable.

The target approach puts pressure on firms and policy makers to think long term and to put in place measures for achieving these long-term aims. However, the targets approach does not automatically lead to policy instruments capable of doing this and near-term targets in particular might often be tackled with existing instruments, fostering incremental technological innovation (e.g. increasing energy efficiency or deployment of the most mature renewables technologies) instead of broader, structural change in socio-technical systems.

- public RD&D funding and subsidies

Governments have long played a role in stimulating innovation by public RD&D spending as well as subsidising the diffusion of new technologies. This can take the form of grants, tax incentives or other means to stimulate private investment in RD&D. Diffusion of desired technologies has been subsidised, for example by providing tax credits and direct subsidies or providing premium prices, e.g. through feed-in tariffs. The IPCC confirms that "RD&D can stimulate technological advances, reduce costs, and enable progress toward stabilization" (IPCC 2007b: 19). The analysis of RD&D policy is an established and advanced field of study. Within this literature there is a major rift between technology-push and demand-pull approaches (Grubb 2005) and there is a divergence of views on "whether existing technologies are sufficient to tackle climate change or whether a major increase in R&D is necessary (IPCC 2007a: 148). Some scholars have argued that the technologies to solve the greenhouse gas emissions problem are available (Pacala and Socolow 2004) but that they need to diffuse more, thereby restructuring existing systems, lifestyles and institutions. Also, the former UK Prime Minister Tony Blair was recently cited as saying that 'practical policy making' was now needed if the fight against global warming was to be effective and that technological solutions to climate change were 'well within our grasp' and that only political will was needed to implement them (Harrabin 2009).

While dedicated RD&D policy is certainly central to fostering innovation for more sustainable electricity systems, it will not on its own lead to 'system innovations' because it

is too focussed on marketable, technological innovations and neglects necessary changes in infrastructures, institutions, policy, and lifestyle changes.

All of these approaches are important and might stimulate incremental and radical technological innovations but they are not sufficient to bring about 'system innovations' in electricity.

1.2.4 Possible policy approaches to foster 'system innovations'

The increased academic attention given to understanding 'system innovation' processes has also led to a policy recognition that systemic changes need to happen in electricity systems. As claims about the need for systemic change have been increasingly accepted by policy makers, debates in technology policy have partly shifted towards considering "how governments can catalyse fundamental system-wide change" (Lovell 2007: 35). Very recently, policy makers have begun experimenting with policies to foster 'system innovation' more explicitly. Two such approaches are discussed in more detail below.

- 'structural change in the market'

In the UK 2000 Climate Change Programme the Department for Environment, Transport and the Regions (DETR) described its philosophy for making the transformation to a low carbon economy:

> "The Government and the devolved administrations cannot predict how technology will develop over the coming decades, nor are they best placed to do so. But they can set out the long term goal, offer incentives to change, support the development and introduction of some new technologies, and help organisations to anticipate and start adapting to longer term developments. An increasing number of studies are trying to explore how processes and lifestyles might change. We need to build consensus about the need for change, the priorities and action that can be taken to achieve the optimum rate of change and minimize uncertainty and costs both for business and consumers" (DETR 2000: 29).

The programme acknowledges that major structural changes in the supply and patterns and methods of energy consumption will be required to make the transition to a low carbon economy. It is argued that this new philosophy is put into practice through the Carbon Trust,

> "to deliver an integrated programme of support to accelerate the take up of low carbon technologies and other energy saving measures, and help business to prepare for a low carbon future through education and training, and strategic research and development" (DETR 2000: 71).

These quotes indicate that Government thinking goes beyond technologies to also include 'soft factors' such as incentives, organisational strategies, education, training, and changes in lifestyles. The need for fundamental change is also emphasised in the DEFRA and DTI policy document *Changing Patterns*:

> "Changes in behaviour from producers and consumers are clearly important, but some structural change in the market [emphasis added by FK] itself is also required to encourage more sustainable patterns of consumption and production. This means stimulating innovation in technologies, markets and behaviour, so that the choices on offer from the market make it easier to take the more sustainable option... In the fields of energy and transport, the Government is looking at what system and infrastructure innovations may be required to move to a more sustainable future" (DEFRA and DTI 2003: 28).

DEFRA has thus clearly acknowledged that structural change in markets, systems, behaviours and infrastructures is required to encourage more sustainable production and consumption patterns. This understanding comes very close to what has been described as 'system innovations' above, as technological innovation is understood to be embedded in a wider societal system. The Carbon Trust (CT) is the key policy initiative for fostering innovation to make the transition to a low carbon economy in the UK. The then Prime Minister Tony Blair announced that the CT would "take the lead on low carbon technology and innovation in this country, and put Britain in the lead internationally" (cited in: Carbon Trust 2003: 44). The IEA referred to the Carbon Trust as "one of the major government initiatives to curb emissions" (IEA 2004b: 352). Patricia Hewitt, then DTI Minister of State, praised the Carbon Trust as a 'ground breaking' initiative bringing together "for the first time in Europe – a fully integrated programme of incentives worth up to £150 million annually on low carbon technology and business energy efficiency" (Hansard, written

answers text for Monday 19 Mar 2001, Volume No. 365, Part No. 54). Other initiatives such as the Technology Strategy Board and the Energy Technology Institute etc. were set up much later and have a narrower remit. In contrast, the CT is based on an integrated, long-term approach working across different sectors (DETR 2000). The remit of the Carbon Trust has been defined as "accelerating the move to a low carbon economy" (Carbon Trust 2007a: 3) and is thus not limited to technology development and deployment although this is a key part of its mission. The IEA stressed that the CT will consider not only commercial and technological factors but also wider socio-economic factors hindering the move towards a low carbon economy (IEA 2002: 53).

- deliberate steering of 'system innovations' through transition management

A very explicit approach for steering 'system innovations' towards sustainability has emerged in the Netherlands. To some extent this approach combines some of the instruments discussed earlier, but it adds new features and a different steering philosophy. Transition management (TM) aims at influencing structural change in socio-technical systems alongside system optimisation by a set of coherent interventions (Rotmans, Kemp et al. 2001b; Kemp and Rotmans 2004; Loorbach and Rotmans 2006). The policy model was developed to tackle persistent, structural problems of unsustainability unsolved by traditional short-term policy approaches in systems such as energy, construction, mobility or agriculture (Loorbach 2007). The basic idea of transition management is that processes of change in a complex society cannot be controlled, but that it is possible to influence the speed and direction of the structural processes of change.

The ideas informing TM are based on a multi-level perspective on 'system innovations' (Geels 2004a: 914). Based on historical case studies Geels distinguishes between niche, regime and landscape level. The landscape level comprises slowly changing external factors such as climate change, which influence the development of the energy system but are beyond the control of individual actors. The current fossil-fuel based energy regime is characterised by a dominant configuration of certain technological artefacts, institutions, networks, user practices, market structures, regulatory frameworks, cultural meanings and

scientific knowledge. Regimes are thought to be relatively stable configurations (Rip and Kemp 1998). Their alignment provides stability for technological development. The downside of this stability has been termed ‘lock-in’ (Unruh 2000) or ‘entrapment’ (Walker 2000). In general, the literature on change in technological regimes has put emphasis on change along these existing (incremental) trajectories (Berkhout 2002). On the niche level new energy practices and technological innovations such as renewable energy technologies emerge in protected spaces or market niches, evolve over time and may possibly start to compete with the dominant regime and eventually ‘overturn’ it. ‘System innovations’ occur through interactions between developments on all three levels.

In the TM model, positive visions of the future play an important role in outlining long-term goals and in developing pathways along which those goals can be achieved. The model suggests bypassing existing (possibly captured) policy networks by establishing so-called transition arenas. These public–private networks with a focus on frontrunners are hoped to overcome lock-in in existing systems by engaging diverse societal actors in a reflexive and deliberative learning process. The model suggests conducting ‘transition experiments’ to learn about and test alternative energy practices and technologies. The authors suggest, for example, instruments such as taxes to create a ‘more level playing field’ in which different practices and technologies compete (Kemp and Rotmans 2004: 152). Policy prescriptions based on transition theory include the following activities: to create (market) niches for sustainable innovations (Hoogma, Kemp et al. 2002; Hisschemoller, Bode et al. 2006), to put the existing regime under pressure through ‘control policies’ (Kemp and Rotmans 2004: 164), and to guide the general direction of the process, for example through visioning and backcasting exercises involving stakeholders (Rotmans, Kemp et al. 2001b; Quist and Vergragt 2004). The policy prescription of TM will be discussed in more detail in sections 2.1 and 4.3.

As scholars and policy makers have shifted their attention towards ‘system innovations’ as a possible solution to problems of unsustainability, empirical analysis of policy initiatives which are aimed at ‘system innovations’ is a new and worthwhile field of research.

1.2.5 The neglected politics of governing electricity 'system innovations'

As has been argued above, 'system innovations' are interesting from a normative point of view as they may offer environmental benefits through the development of new systems that are inherently more environmentally benign (Kemp and Rotmans 2004: 138). However, electricity infrastructures have been characterised as socio-technical systems dominated by a particular complex configuration of technological artefacts, user practices, market structures, rules, regulatory regimes and scientific knowledge, which only changes slowly over time and can be difficult to steer. The problems of current electricity systems are deeply rooted in these complex societal structures. Overcoming mechanisms variously referred to as 'momentum' (Hughes 1983), 'entrapment' (Walker 2000), or 'carbon lock-in' (Unruh 2002) is no easy task. As a result, it is notoriously difficult to achieve a shifting of development trajectories in this domain.

Policy scholars have cautioned that solving environmental problems entails differing degrees of difficulty: "Where a relatively inexpensive technological fix is not possible and solutions may require major behavioural change and/or social or economic restructuring, political will and public interest begin to wane" (Connelly and Smith 2003: 132). Jänicke and Jacob argue that for "certain environmental problems there is, indeed, the necessity of a structural change, e.g. the phasing out of nuclear energy or lignite coal, which cannot be effected via market mechanisms" (Jänicke and Jacob 2005: 177). They argue that structural change[3] requires huge political endeavour and is therefore possible only in exceptional circumstances. With regard to climate change, as far back as the 1990s, commentators argued that "limiting emissions is not just a matter of technology and costs, but of culture, institutions and politics in the broadest sense" (Grubb, Rayner et al. 1991: 911).

The field of governing socio-technical change is therefore an important area of study for scholars interested in sustainable development. Meadowcroft claims that

> "the transformation of existing technological systems is critical to addressing contemporary environmental problems – such as human-induced climate

[3] In this context they see structural change as the decrease of an industry in its core technologies.

> change – and understanding how such a transformation can be brought about constitutes an important challenge" (2005: 479).

This thesis argues that this is particularly true for the challenge of transforming electricity systems towards more sustainable configurations. Far from being an obvious process of 'managing' a system towards some unanimously agreed sustainable end point, the call for 'system innovations' is not only a technological but also a political challenge. If this is the case, we need to look at the politics of policy initiatives aimed at fostering such wide-ranging change.

1.3 Research Question of this thesis

As derived from the considerations outlined above, the overall research question of this thesis is:

What are the politics of policy initiatives to stimulate 'system innovations' towards more sustainable electricity systems?

To answer this research question the thesis will focus on two specific initiatives in the Netherlands and the UK. Both countries have ambitious long-term goals to transform their electricity systems and have set up dedicated policy initiatives to support this transformation.

The overall research question will be approached by answering a number of more specific supporting research questions:

1. How are the national governments in the UK and the Netherlands trying to foster 'system innovations' towards more sustainable electricity systems? Why were the two policy initiatives designed and implemented in the described ways?

2. To what extent have they delivered on their stated aims in terms of outputs and outcomes?

3. *What are the political constraints that each initiative has encountered, why do these arise and what are the lessons for government initiatives aimed at fostering 'system innovations' towards more sustainable electricity systems?*

In this thesis politics is understood as being not only about actors realising given interests, but also in the following way: "Politics embraces the processes of argument, negotiation, and struggle over joint actions or decisions – most often the decisions of what policies will be adopted by government institutions" (Dessler and Parson 2006: 34). Especially in situations of uncertainty, actors may not be sure about what their interests actually are. Processes of 'system innovations' where both the processes and the outcomes are unknown are characterised by uncertainty. As will be explained in more detail below, politics can also be usefully understood as a 'struggle over the best story'. This struggle takes place in an institutional context. Building on such an expanded concept of politics in line with discursive approaches in policy studies, the hypothesis of this thesis is that political struggles about meanings within existing institutional contexts enable, shape and constrain policy initiatives aimed at 'system innovation' in electricity systems in important ways.

1.4 Overview of the thesis

Chapter 2: Literature review and Analytical Framework

Chapter 2 first looks at the transitions and transitions management literature and finds that the politics of these processes have been underplayed in this literature up until now. It then reviews the literature on policy and institutional change in order to derive an analytical framework suitable for answering the research questions outlined above. The literature review focuses in particular on interpretive approaches in policy analysis, paying attention to discourses, as well as institutional theory. This particular emphasis will be justified within the chapter. Drawing upon insights from policy studies and political science, a framework is developed for analysing the politics of government initiatives aimed at fostering 'system innovations' based on the interplay between discourses and institutions.

Chapter 3: Methodology

The third chapter spells out the methodology used in this thesis. It explains the research design, the rationale for choosing a case study approach, justifies the choice of cases and reflects on the limitations of the methodology. This chapter also details the sources of data collection and methods of data analysis. It also operationalises the main concepts of the analytical framework to be used in the analysis.

Chapter 4: The Energy Transition project in the Netherlands and
Chapter 5: The Carbon Trust in the UK

Chapters 4 and 5 contain the empirical analysis of this thesis. Chapter 4 explains the emergence and implementation of the energy transition project in the Netherlands. Chapter 5 explains the emergence and implementation of the Carbon Trust in the UK.

Chapter 6: Cross-case analysis

The analysis in chapter 6 uses the two case studies presented in chapters 4 and 5 to transform the specific explanation of the cases into more general, theoretically-formulated explanations of the politics of initiatives aimed at 'system innovation'. To that end, a variety of discursive mechanisms explaining aspects of the case studies will be discussed. The chapter will also consider existing explanations of why the Dutch energy transition came about and what the thesis adds to these. Thirdly, the chapter will also discuss alternative, interest-based explanations of the cases.

Chapter 7: Conclusions

The conclusions chapter answers the research questions of this thesis and summarises the contributions this thesis has made to knowledge. It also provides some policy recommendations and outlines potential avenues for further research.

2 Literature review and Analytical Framework

This chapter looks first at the transitions and transitions management literature and finds that the politics of steering such processes have to date been under scrutinised. It then reviews the literature on policy studies and institutional theory. Drawing on these insights, a framework is developed for analysing the politics of government initiatives aimed at fostering 'system innovations' based on the interplay between discourses and institutions.

2.1 The neglect of politics in the transitions and transition management literature

In normative debates about socio-technical transformations scholars have prescribed important roles for governments: Hisschemöller et al. argue that governments can play a crucial role through the creation of niche markets (Hisschemoller, Bode et al. 2006: 1227) (see also the literature on strategic niche management (e.g. Hoogma, Kemp et al. 2002)). Quist and Vergragt deem the role of government in facilitating transformations towards sustainability to be "indispensable because of the long time horizon, the complexity of the processes, and the need for an actor that guards the general direction of sustainable development" (Quist and Vergragt 2004: 433). Weber argues that government has a moderating function with regard to relevant actors in terms of 'decentralised network governance' (Weber 2005: 114). Advocates of 'system innovations' generally suggest that government policy has a key role in environmental innovations and that strong core-instruments are needed (e.g. Rennings, Kemp et al. 2004: 27).

Also in the transition management model scholars have prescribed a multiple role for government. Central to TM is the development of shared visions of the future, the setting up of stakeholder transition arenas and conducting transition experiments to explore possible pathways towards more sustainable systems. Beyond supporting niches it is argued

that control policies to put pressure on the existing regime are needed (Kemp and Rotmans 2004: 164). The government is seen as a facilitator-stimulator-controller-director in this process, depending on the phase of the transition (Kemp and Rotmans 2005: 49). Protagonists of transition management (Rotmans, Kemp et al. 2001a; Rotmans, Kemp et al. 2001b; Loorbach 2002; Kemp and Rotmans 2004; Kemp and Rotmans 2005; Loorbach and Rotmans 2006) have prescribed an important role for government in steering such transitions without explicitly recognising and conceptualising the politics of such processes.

As the first PhD thesis in this area, Derk Loorbach's work on transition management as a new mode of governance (Loorbach 2007) mentions politics and power explicitly only very briefly at the end of his thesis, while he implicitly refers to politics and interests several times in his case study descriptions. For example the dominance of the energy companies in the Dutch energy transition is criticised but there is no deeper theoretical analysis or explanation of this fact nor a reflection of what this means for the transition management model itself. Loorbach confirms that "so far little attention has been directed towards issues of power, institutions and leadership" (Loorbach 2007: 294). He suggests that TM could learn much about the dynamics of power from policy science and politics studies. He acknowledges that "transitions are ultimately shifts in power" (Loorbach 2007: 294) in that regime actors will have to change to be in tune with the structural changes in the socio-technical system or they will perish.

Others have already criticised the lack of attention to power in the analysis of transitions (Smith, Stirling et al. 2005; Hendriks and Grin 2007) or pointed to political difficulties the government will encounter in any attempt to steer transitions (Jänicke and Jacob 2005; Meadowcroft 2005). Most vocal about this neglect, Shove and Walker have argued that the politics of transition management require more explicit attention on at least three dimensions. They argue that the very abstraction of a socio-technical system as an object to be steered from 'outside' is not only an analytical challenge but is essentially a "political, constructed, and potentially contested exercise in problem formulation" (Shove and Walker 2007: 765). Politics here takes the form of "a playing out of power of when and how to decide and when and how to intervene" (Shove and Walker 2007: 766). This point is

supported by Smith and Stirling who argue that there is no objective and politically neutral steering of socio-technical systems from the 'outside'. They advocate a move "from a view of 'steering as management' to an understanding of 'steering as politics'" (Smith and Stirling 2007: 369). Secondly, Shove and Walker point out that constructing visions and shared commitments in transition processes are not neutral exercises but can be co-opted to neutralise dissent, that they reflect and are shaped by current systems and that power and strategic behaviour are always present in foresight or deliberation exercises. Thirdly, Shove and Walker argue that TM advocates underestimate the ambivalence of sustainability as a goal by assuming that strategies to foster "transitions towards more environmentally and socially benign systems" can be identified, while they argue that defining such systems is problematic and conflict-laden (Shove and Walker 2007: 766).

Maybe partly in response to these criticisms, TM advocates have recently paid greater attention to power in transition processes. Avelino and Rotmans pointed out that "[s]o far, a conceptualization of power is missing, as this current literature on transitions does not explicitly define nor mention power" (Avelino and Rotmans forthcoming: 2). They see transitions as

> "a particular power struggle between the current regime, upcoming niches and landscape pressures. Whereas implicit references to power are obvious, an explicit integration of power concepts is lacking and confronts transition studies with a conceptual weakness" (Avelino and Rotmans forthcoming: 4).

While this paper is a helpful first attempt at – at least conceptually – incorporating power issues more fully into the analysis of transition processes in terms of landscape, regime and niche interactions in different transition phases, it remains unclear what the political limitations and opportunities for government are empirically in the context of deliberate attempts to steer 'system innovations'.

This thesis argues that so far these debates have been overly optimistic about the role of government in steering 'system innovations', while neglecting the realities of policy formulation and implementation which is essentially a political process, not a managerial task. Meadowcroft points out that transition management

> "appears to make rather stringent demands on political systems, for substantial policy stability and resilient political coalitions would be required to keep reform from being derailed by changes in political personnel and a turbulent conjuncture" (Meadowcroft 2005: 491).

What is more, government is not a unitary actor and is deeply embedded in existing structures of current socio-technical regimes.

If transitions are to a large degree political processes resulting from decisions by multiple actors, then political dimensions should be at the heart of the analysis. This thesis argues that the policy prescriptions based on transition theory to date lack a thorough understanding of the politics of steering 'system innovations'. The hypothesis is that the processes of politics play a crucial role in any government attempt to steer 'system innovations' towards sustainability. Politics plays a role in governing transitions through:

- the definition of problems with the current electricity systems;
- envisaging the goals of a new system (what should a sustainable electricity system look like?);
- considering which alternative niches to support (e.g. supporting transition experiments, funding technology demonstration);
- unsettling existing ways of fulfilling societal functions (putting regime under pressure to change); and
- the redistribution of resources (e.g. subsidies for renewables instead of fossil fuels).

As has been pointed out above, much is expected from governments in actively steering 'system innovations'. Moreover, transformations of socio-technical systems are widely argued to involve crucial changes in policies and institutions which are part of the incumbent socio-technical systems. This thesis argues that the political science and policy studies literature has much to offer in studying the phenomena of institutional and policy change. It will be argued that studying new policy initiatives as case studies of why and how policy and institutional change happens, helps to reflect on political opportunities and constraints for governments in contributing to a transformation of the electricity system more generally. To derive a framework suitable for answering the research questions posed above, the policy studies as well as institutional theory literature is reviewed below.

2.2 Policy Studies, Politics and Discourse Analysis

Policy studies aim at explaining policy processes (Howlett and Ramesh 2003; Hill 2005). Scholars have sought to develop theories of policy processes, analyse the content of specific policies and aim at explaining causal mechanisms driving policy change. One of the main contributions of policy studies is the finding that decision-making varies vastly from policy sector to policy sector (John 2003: 482). Policy studies often focus on the core groups or individuals who play an important role in the policy process such as advocacy coalitions (Sabatier and Jenkins-Smith 1993; Sabatier and Jenkins-Smith 1999), epistemic communities (Haas 1992), policy networks (Mayntz 1993; Smith 2000) or discourse coalitions (Hajer 1995). Policy change is often seen as being driven by such networks of actors (Lovell 2008). These networks typically include state and non-state actors. One crucial difference between these approaches is the question of what is believed to hold these networks together. Policy networks for example are based on resource interdependencies between actors, advocacy coalitions are based on shared belief systems, discourse coalitions share a common understanding of policy problems, and epistemic communities are networks of professionals based on shared knowledge.

While being interested in the actors involved in policy-making processes, a particular emphasis is often put on studying the politics of policy processes as "politics create policies, policies also remake politics" (Skocpol, cited in: Hay and Wincott 1998: 955). Politics is commonly understood as the process of making decisions, for example about the choice of instruments (Dessler and Parson 2006). There are numerous definitions and conceptualisations of politics in the literature. Central to a conventional understanding of politics are factors such as conflict, interests and power struggles.

2.2.1 Towards an ideational understanding of politics

Traditionally,

> "Political sociology and political science have focused on how the pursuit of self-interest affects politics and policy making in advanced capitalist societies. This has been true for pluralist, elite, neo-Marxist, historical institutionalist, and rational choice theories. Scholars have paid far less attention to how ideas, that is, theories, conceptual models, norms, world views, frames, principled beliefs, and the like, rather than self-interests, affect policy making" (Campbell 2002: 21).

However, there has been a turn in policy studies to go beyond traditional explanations of politics based on interests and power struggles. This development, seen since the 1990s, has been described as the 'argumentative turn' (Fischer and Forester 1993), the 'ideational turn' (Blyth 1997) or the 'cognitive turn' in policy studies (Nullmeier 2006). Despite the differences in emphasis, the common aim of these research agendas was to take ideas seriously as explanatory factors in policy change. In the discipline of international relations scholars have also rediscovered the importance of ideas in policy making (Yee 1996).

A wide range of scholars has since focussed on ideas in studying the politics of policy processes. Politics can be understood as "a struggle for power played out in significant part through arguments about the 'best story'" (Fischer 2003: x). Convincingly, Hay points out that:

> "If we are prepared to concede that what differentiates social and political systems from their counterparts in the natural sciences is the presence of reflexive actors capable of shaping the environment in which they find themselves, then it is no large step to acknowledge that the ideas actors hold – both normative and descriptive – about that environment must be accorded an independent role in political analysis. Though many political analysts have been reluctant to make this move it is, frankly, implausible to suppose either than [*sic*] actors have complete information of the context in which they find themselves or that their behaviour is rendered entirely predictable by the (presumably transparent) material interests they hold in any given context. Yet qualify either of these assumptions and an independent role for ideas is immediately opened within political analysis" (Hay 2002: 257-258).

If we accept such a proposition then politics plays a much more fundamental role than in simply choosing the 'right' policies to achieve a given policy goal or when to intervene in an objectified 'socio-technical system'. Rather, politics plays a major role in identifying and framing the problem of how to achieve more sustainable electricity systems. In Hajer's

understanding, “politics involves a struggle for discursive hegemony in which actors seek to secure support for their definition of reality” (Ockwell and Rydin 2006: 383). Hajer has pointed out that discursive features are essential attributes of policy domains and that neglecting these discursive structures “leads to unduly optimistic and in fact rather technocratic thinking about policy change” (Hajer 1995: 275). The policy recommendations of transition management have been criticised for having such technocratic overtones (Shove and Walker 2007; Scrase and Smith 2009), which makes it important to study the discursive politics of this endeavour.

Arising from the claim that the definition of policy problems is based on potentially contested ideas and political construction, the analysis of ‘problem framing’ becomes important for the study of politics. One example of such framing effects that is relevant for this thesis is the divergent policy implications of different understandings of technical change. According to Grubb it matters greatly whether policy makers understand technical change as depending mostly on autonomous trends and government R&D or as depending on corporate investment in response to market conditions because the policy implications differ. In the first case the government would try to induce technical change by using technology push policies such as public R&D support. In the latter case the government would, for example, try to impose emission caps or carbon pricing and use a variety of instruments to re-orient industrial R&D and spur market-based innovation. Grubb argues that “divergent perspectives on the process of technology change lead to directly opposing policy prescriptions” (Grubb 2005: 113). It thus matters greatly which of the two understandings dominates policy making.

A major strand of work on the framing of policy problems has focussed on discourses. Maarten Hajer wrote a seminal work using discourse analysis to analyse the emergence of the ecological modernisation ideas in the Netherlands and the UK (Hajer 1995). His work has been widely acknowledged and offers a broad, often cited definition of discourse. Hajer defines a discourse as “a specific ensemble of ideas, concepts, and categorizations that are produced, reproduced, and transformed in a particular set of practices and through which *meaning* is given to physical and social realities” (Hajer 1995: 44) [emphasis added by FK].

The discourse analytical framework developed by Hajer sheds light on how discourse coalitions form around shared storylines, how they compete for political influence and how discourses structure the solutions offered to the policy problems they 'create'. Discourse analysis reveals the role of language in politics through paying attention to the specific situational logic in which a particular account of problem and solution arises (Feindt and Oels 2005; Hajer and Versteeg 2005). It is important to stress that, despite the focus on language, discursive analysis is not only about language: it is about the way language shapes political action and practices.

There are two reasons why Hajer's discourse analytical framework is considered helpful in answering the research question of this thesis (also see Smith and Kern 2009). First, while there seems to be a consensus among policy makers that electricity systems have to change substantially, the precise formulation of the problem, who is responsible and what can be done to achieve more sustainable electricity systems, is controversial. Discourse analysis sheds light on those processes and is thus a suitable approach for tracing the politics of policies aimed at greening the electricity system. Hajer rightly points out that the meaning of concepts like sustainable development cannot be imposed in a top-down way

> "but are continuously contested in a struggle about their meaning, interpretation and implementation. In trying to make sense of this struggle, discourse analysis has three particular strengths; the capacity to reveal the role of language in politics, to reveal the embeddedness of language in practice and to illuminate mechanisms and answer 'how questions'" (Hajer and Versteeg 2005: 176).

Second, compared to rational choice approaches (Hay 2004) discourse analysis puts emphasis on socially constructed discourses and their influence on practices, which makes it suitable for answering my research questions as it takes the explanation beyond a simple reference to interests. Instead it analyses the mechanisms of "how interests are played out in the context of specific discourses and organizational practices" (Hajer 2000). Other approaches to studying politics often assume policy problems to be a given and then analyse the processes of decision making.

In the following an argument will be made for why more traditional conceptualisations of politics based on power and interests are on their own insufficient for the purposes of this thesis, which strengthens the case made for using a discursive approach to studying politics.

2.2.2 Limitations of the conventional understandings of politics

Conventionally, the analysis of politics is based on the study of power relations and the influence of interests. In this understanding of politics, actors use different forms of power to achieve outcomes which are in line with their material interests: "For sceptics – variously realists, materialists, and often rationalists – ideas do not matter, as power and material interests ultimately drive politics" (Price 2006: 252).

Power, understood as the ability of actors to make other actors do something which they would not otherwise do (McLean and McMillan 2003), is a central concept of political analysis. However, it is also one of the most contested concepts in political science. Arts and van Tatenhove argue that "[i]t seems as if there are as many definitions and approaches as there are power analysts" (Arts and van Tatenhove 2004: 346). Avelino and Rotmans for example distinguish between instrumental, structuralist and discursive interpretations of power (Avelino and Rotmans forthcoming). Some analysts focus on actors using resources to achieve desired outcomes at the expense of other actors, some consider power in organisational terms and others situate power at the level of structures. Arts and van Tatenhove warn that it is not enough to focus on resources alone and to equate these with outcomes. Instead they argue that policy actors may "become influential not only by organizational resources, like money, personnel, tactics, but also by arguments and persuasion, or by both" (Arts and van Tatenhove 2004: 347). Thus, using a discursive approach does not mean that power does not play a role in politics but rather it introduces a different understanding of power. According to Hajer, the

> "argumentative activity is an independent layer of power practices that is far more complex in its logic than a conventional realist analysis suggests. The politics of discourse is not about expressing power-resources in language but is about the actual creation of structures and fields of action by means of

> story-lines, positioning, and the selective employment of comprehensive discursive systems (such as law or physics), etc." (Hajer 1995: 275-276).

Others would go even further; for example, in Dryzek's reading of Foucault there is no distinction between power and discourse, as for Foucault discourse *is* the operation of power (Dryzek 1997: 11). Even if we do not follow this specific interpretation it should have become clear that it is not the case that power is not important for the analysis in this thesis. On the contrary, discourse analysis

> "allows one to study the power effects produced by and built into environmental discourses. The environmental discourse that constitutes an environmental problem enables and constrains the available policy options and the range of legitimate actors for its resolution" (Feindt and Oels 2005: 169).

A hegemonic discourse exercises its power by defining the established categories of a policy discussion: oppositional discourses are then left with the choice of using the established categories or of stepping outside those categories and insisting on their own mode of expression which could see them losing influence (Fischer 2003: 88). Actors who want to influence policy must either speak in a way that is consistent with the dominant problem definition or seek to change it (Laird 2001). Similarly, Baumgartner and Jones point to the possibility of influencing the problem definition as a "potential route to political power by relatively weak opponents to large economic interests" (Baumgartner and Jones 1991: 1050).

Of course critics would still point out that the material interests of actors drive politics. Why would the analysis thus deal with discourses and not just focus on interests? Fischer argues that during the last 30 years a lot of support has accumulated to back up the claim that ideas are relatively autonomous of interests and institutions. This shift towards also considering ideas and discourse arises from the encountering of problems with explanations of policy making based purely on interests and structures. Some discussion within policy studies thus shifted to focus on "how political and social ideas define the kinds of problems that government come to deal with" (Fischer 2003: 45-46). However, this is not to suggest that interests do not exist, nor that they do not matter for the explanation of policy change.

Material interests are usually hypothesised to be relatively stable over time, rational in their attempts to maximise personal gain and therefore to a large extent ‘knowable’. The point that ‘ideas matter’ has been regarded with deep suspicion by large parts of the political economy and political science communities: “Instead self-interest is taken to be the unambiguous and ever-ready tool for explanation” (Blyth 2002: viii). However, consider a simple example to explore this notion of interests: according to this line of thought it is common to assume that a politician wants to be re-elected, a company wants to make a profit and an environmental NGO campaigns against building a new coal-fired power plant because they want to prevent climate change. In a discussion about the decision as to whether or not this new plant should get planning permission, the interests of the NGO and the company who wants to build and operate the plant are pretty obvious. However, the situation of the politician is more complicated. Does he hope for a campaign donation which will help to get him re-elected, does he hope for local employment benefits from the plant or does he look forward to the local taxes paid by this company, which he intends to spend on community projects if he approves the plan? Or is it in his interest to reject the plan in order to appeal to his green credentials and win the next elections based on the support from green voters? Even when at first sight there seems to be an obvious interest (to get re-elected), this simple example shows that it is unclear what the best strategy is for achieving the politician’s interests and whether his interest is independent of how he views the world around him. Thus interests are not always easily ‘knowable’, especially when one considers Hay’s point that actors will rarely have perfect information about the context in which they find themselves (Hay 2002: 257-258).

Another important point in the context of long-term and complex processes such as ‘system innovations’ is that while interests might be seen as relatively stable in known issues, they are relatively unknown or uncertain for long-term issues. Laird argues that in some cases interests are well established and policy choices have a clear knowable impact on the way they affect wealth and income. However, in debates over future energy systems this is a different matter: it is unclear what the future will be like and there are huge uncertainties over interests and outcomes (Laird 2001: 14). Dessler and Parson argue along similar lines that the use of argument and persuasion for the adoption of certain courses of action has

varying influence on policy making but is particularly effective when, amongst other things, there is "enough uncertainty that many political actors do not line up predictably according to either their general political principles or how the issue is going to affect them" (Dessler and Parson 2006: 36). Similarly, building on work by Knight, Blyth argues that in situations of uncertainty[4] (situations regarded by contemporary actors as unique), actors are not sure what their interests actually are and so interests in this situation need to be explained rather than be used to explain policy and institutional change (Blyth 2002). Also, Schmidt points out that, for example, events can create sufficient uncertainty to allow an opening to ideas that challenge the predominant ideas due to eroding interest coalitions in response to a crisis which loosens the institutional constraints to change (Schmidt 2001: 252). This thesis argues that the urgent need to transform electricity systems is an instance in which this kind of uncertainty exists as there is no precedent for the challenge of deliberately steering whole socio-technical systems towards sustainability. Actors are unsure which of the potentially possible future electricity systems, in which configuration, would best suit their interests. Thus a simple reference to interests does not make much sense as an explanation of policy processes in this context.

Another reason for including discourse as central to the analysis is that simple reference to actors' presumed, stable economic interests does not much help to explain the dynamics of policy and institutional change. Schmidt suggests that

> "for the dynamics of change, we must be able to go beyond 'politics as usual', that is, beyond an understanding of the interplay of interests, institutions, and cultures that represent the background conditions to change, to explain how political actors create an interactive consensus for change, which necessarily can only come about through communication" (Schmidt 2001: 249).

Schmidt argues that, for example, the liberal adjustment policies in different European states in response to globalisation cannot be understood as 'politics as usual' because the adjustment policies by definition "went against the narrow self-interests of large groups if not a majority of the electorate, challenging deeply-held values and reversing longstanding practices" (Schmidt 2003: 129). Policies to foster 'system innovations' are very similar in

[4] Blyth distinguishes between situations of risk in which "agents are sure of their interests but are unsure of how to achieve them" and situations of uncertainty in which agents "are unsure as to what their interests actually are, let alone how to realize them" (Blyth 2002: 9).

this respect, since they: go against the self-interest of a large number of actors with vested interests in the existing system; imply radical institutional change, or; go against national identity and values. In line with (Schmidt 2001) the question in such situations is thus: how do governments gain acceptance for these new policies and institutional changes? She claims that discourse analysis sheds light on the political dynamics of "how governments managed to gain agreement for change from relevant policy actors and the general public" (Schmidt 2001: 248). Similarly, Hay argues that the turn to ideas allows a dynamic understanding of policy processes as

> "Ideas often hold the key to unlock political dynamics – as change in policy is often preceded by changes in the ideas informing policy and as the ability to orchestrate shifts in societal preferences may play a crucial role in quickening the pace, altering the trajectory or raising the stakes of institutional reform" (Hay 2002: 194).

According to this line of reasoning interests and ideas are interacting in complex ways and are therefore not independent of each other (Laird 2001). Similarly, Blyth maintains a position in which "[a]gents' interests are themselves social constructs that are open to redefinition through ideological contestation" (Blyth 2002: 270-271). He aims to break the long-standing tendency in political science to treat ideas and interests as mutually exclusive analytical categories and instead considers them as mutually constitutive, particularly in situations of uncertainty. Blyth's conception of interests considers 'wants, beliefs, and desires' as important cognates of interest; thus interests are not structurally determined but are constructed based on 'wants' mediated by beliefs and desires; therefore ideas matter (Blyth 2002: 29). Also, Hajer rejects the idea that interests are assumed as given and instead argues that they are "intersubjectively constituted through discourse" (Hajer 1995: 59). Again this does not mean that interests are not 'real' nor that they do not influence politics but it acknowledges that ideas play an independent role in policy change which cannot be treated as a simple derivative of other influences on policy such as interests or institutional structures: "The point is to ensure that we do not reduce ideas to some cynical derivatives of interests, since ideas are actually constitutive of interests" (Laird 2001: 4). He argues that an analysis which stresses the interaction of ideas with interests provides "a more nuanced account of the process of policy making" (Laird 2001: 7). Compared to rational choice approaches of studying public policies (which would look at the costs and

benefits of a course of action and the structurally given material interests of actors to explain policy change), discourse analysis takes the explanation beyond a simple reference to interests, analysing "how interests are played out in the context of specific discourses and organizational practices" (Hajer 2000). It therefore does not deny the importance of interests for policy change but nor does it assume them to be easily 'knowable', stable or independent of ideas.

The debate over the extent to which ideas matter or whether interests dominate politics is a controversial issue in social science and partly depends on epistemological assumptions (see more on this issue in the methodology chapter of this thesis). Solving this long-standing debate cannot be the aim of this thesis – the aim is rather more modest. Rueschemeyer states

> "that ideas matter in politics is beyond question…Yet the importance of ideas compared to other factors shaping social processes has been a matter of debate throughout the history of social thought. Global answers to this question may be inherently elusive; but more detailed questions – perhaps confining themselves to specific developments and circumstances – can elucidate the ways in which ideas make a difference, the conditions that make them more or less effective, and their interactions with other factors that account for social change as well as stability" (Rueschemeyer 2006: 227).

In line with this suggestion this thesis aims at elucidating the role of ideas in the shaping of two concrete policy initiatives aimed at greening electricity systems in two different contexts.

2.2.3 Discourses and institutions

However, discursive politics does not take place in an institutional void; rather, processes of politics are bounded by the structure of institutions (Dessler and Parson 2006). Campbell argues that when studying actors and how they carry certain ideas into the policy-making process it is important to acknowledge that these actors do not operate in a vacuum. Institutions like "the formal rules and procedures governing policy making affect which ideas penetrate the policy-making process and are adopted and implemented as policy"

(Campbell 2002: 30). Analysis thus needs to shed light on these institutional filters. Similarly, Chang argues that

> "Politics is an institutionally structured process, not only because institutions shape people's political actions, given their motivations and perceptions, but because they influence people's perception of their own interests, of the legitimate boundary of politics, and of the appropriate standard of behaviour in politics" (Chang 2002: 556).

In Chang's understanding institutions are both 'constraining' as well as 'constitutive' of the perceptions and motivations of human beings, and influence interests and thus politics.

While mainly being interested in policy processes, discourse analysts acknowledge the importance of institutions in policy making and the interactions between discourse and institutions. According to Fischer,

> "for discourse scholars, then, *political action is constituted by discourses* [emphasis added by FK], from hegemonic discourses embedded in the existing institutions (for example, the theories and practices of liberal capitalism) to the oppositional efforts of other groups attempting to create new discourses (for example, environmentalism). Public policies are not only influenced by the discourses of particular groups, they are shaped and supported by the institutional processes in which specific discursive practices are embedded, processes which can have a life of their own" (Fischer 2003: 45).

Discourses are manifested not only in political rhetoric but also in "institutional structures, practices and events" (Sharp and Richardson 2001: 119). Existing institutional contexts enable and constrain what can be said, but the social order also needs to be "constantly reproduced and reconfirmed in actual speech situations" (Fischer 2003: 85-86). Discourse analysis is not just looking at language and what is being said; the analysis also includes "the institutional context in which this is done and which co-determines what can be said meaningfully" (Hajer 1995: 2). Similarly to Fischer, Hajer claims that a discursive order

> "even if it has solidified in all kinds of institutional arrangements (like laws, organizational routines, or categorizations) requires a constant discursive reproduction to guarantee the continuity of its meaning structures" (Hajer 1995: 125-126).

The discourse analytical approach thus tries to bridge actors and institutional structures through their respective relationships to practices (Hajer and Laws 2006). Actors and their

discursive practices are shaping institutions and are influenced by existing institutions. This is Hajer's way of taking on Gidden's idea of the duality of agency and structure. Drawing on Foucault's theory of discourse he acknowledges that "institutions are only powerful in so far as they are constituted as authorities vis-à-vis other actors through discourse" (Hajer 1995: 51).

Ultimately, there is another argument for the inclusion of institutions into the analysis, which derives from the transitions literature. 'System innovations' will require changes in policy as well as institutions. Geels defines socio-technical systems (STS) as "the linkages between elements necessary to fulfil societal functions" (Geels 2004a: 900). An important part of such STS are 'policy regimes' or relatively stable institutionalised forms of state and societal preferences, goals and instruments that help shape the provision of societal goods such as transportation, housing or electricity. These policy regimes include institutions structuring legislative processes, regulations, policy goals, policy instruments, interaction patterns between government and stakeholders, role perceptions of the government, ideas about the effectiveness of instruments as well as problem agendas and guiding principles (Geels 2004a: 906). Transition scholars acknowledge that existing institutions (understood as rules, procedures, routines, patterns, repertoires) can obstruct 'system innovations'. It has been recognised that the interactive processes aimed at steering towards sustainability do not take place in an 'institutional emptiness' and thus scholars have argued for TM as the management of institutional change (Teisman and Edelenbos 2004). Rotmans et al. have called for more research "on the effects of existing institutions and governance mechanisms on transition processes" (Rotmans, Kemp et al. 2001a: 70).

For a variety of reasons discussed above it is therefore important not to limit the analysis of the politics of policy initiatives aimed at fostering 'system innovations' to discourses but also to pay attention to the role of institutions. Below, the political science literature on institutions is reviewed to complement the analytical framework with a conceptualisation of institutions.

2.3 Neo-Institutional Theory

Political science scholars have a long tradition of dealing with the state and institutions of the state. One particular strand of political science has closely studied institutions, its proponents thus being named institutionalists.

Institutions have been defined in variety of ways. A broad definition of institutions which resonates with the emphasis on discourses as providing meaning is given by Scott: "Institutions are comprised of regulative, normative and cultural-cognitive elements that, together with associated activities and resources, provide stability and meaning to social life" (Scott 2008: 48). Institutions can be usefully understood as generally accepted rules which guide the behaviour of actors and can be either formal (e.g. laws, regulations and standards) or informal (e.g. norms, habits and customs) and can create constraints on policy options (Breukers and Wolsink 2007b: 2738).

In principle, scholars within the institutionalist strand of political science would see political constraints (and, to a lesser extent, opportunities) for governments in governing a transformation of the electricity system as being set institutionally. According to John, institutionalism is based on the idea "that formal structures and embedded norms have an effect on human action, which has a long pedigree in political science and appears in the classic writings, from Plato to Montesquieu, de Tocqueville, and Woodrow Wilson" (John 2003: 483). The 'old' institutionalism is an approach grounded in constitutional law and moral philosophy and often produced detailed descriptions of formal or legal institutions and their origin; much of the work was implicitly or explicitly normative rather than theoretically grounded (Scott 2008). The 'old' institutionalism mainly studied the formal institutions of government and defined the state in terms of its political, administrative, and legal arrangements (Schmidt 2006b). This 'old' institutionalism has produced valuable insights but has been criticised for a lack of acknowledgement of individual agency, for being too concerned with normative questions to be a science (the 'good' order of institutions), and for often being descriptive, opaque and vague about any theoretical underpinnings (Peters 2005).

As a response, behaviouralism and rational choice became the two mainstream schools of political science which were both based on methodological individualism[5], had a strict anti-normative bias, were positivist and focussed on the inputs into the political system (which remained a black box because of the focus on the individual). In behaviouralism it is the society and the economy that influence politics and political institutions. In the 'old' and 'new' institutionalism causation can go in both directions and it is argued that "institutions shape social and economic orders" (Peters 2005: 15). Rational choice recognises institutions more, as a means to aggregate individual preferences, but also fails to appreciate that institutions play a significant role in shaping preferences.

The 'new' institutionalism formed in the 1980s and 1990s as a response to these approaches sought to 'bring the state back in' to the explanation of political action while keeping an interest in more methodological and theoretically grounded work (Peters 2005; Schmidt 2006b). These scholars see the conditions of political opportunities as being set institutionally (Hay 2002; Fischer 2003; John 2003). Even the most 'rational' of actors are circumscribed in terms of the options available to them. The basic argument of institutional approaches is that institutions do matter and that "something about institutions…explains the decisions that governments make" (Peters 2005: 164). According to March and Olsen, "[t]his new institutionalism emphasizes the relative autonomy of political institutions, possibilities for inefficiency in history, and the importance of symbolic action to an understanding of politics" (March and Olsen 1984: 734). The research programme of the 'new institutionalism' tries to investigate the ways in which institutions mainly constrain but also enable political action by the state and societal actors (Schmidt 2006b).

[5] Methodological individualism is based on "the assumption that individuals are the only actors and that they are motivated by individual utility maximization" (Scott 2008: 7-8).

2.3.1 Rational choice institutionalism, historical institutionalism and sociological institutionalism

This literature is often sketched by distinguishing three main strands of new institutionalism (Hall and Taylor 1996): rational choice, and historical and sociological institutionalism.

At first it might seem contradictory to combine rational choice and institutionalism, as the analytical power of rational choice theory depends on the utility-maximising decisions of individuals. It seems difficult to combine this starting point with the institutional thought which focuses on the constraining influence of institutions (Peters 2005). However, rational choice scholars have acknowledged the fundamental role institutions play in political life and have thus sought to explain the nature, origin and role of political institutions. The general argument is that economic organisations and institutions are explained in the same way: “they solve collective-action problems and thereby facilitate gains from trade” (Moe, cited in: Scott 2008: 33). There is a variety of approaches within the rational choice institutionalism school of thought but generally “institutions are conceptualised as collections of rules and incentives that establish the conditions for bounded rationality” (Peters 2005: 48). Within these rules, which are constraining and channelling individual behaviour, actors are trying to maximise personal utility, which is seen as the primary motivation of individuals.

Historical institutionalism is very different from rational choice institutional thought in its basic assumptions. Historical institutionalists argue that preferences are not stable and “often result from rather than precede or determine choices. Institutions construct actors and define their available modes of action: they constrain behaviour, but they also empower it” (Scott 2008: 32). The main idea of historical institutionalism is that policy choices made during the formation process of an institution will continue to impact and largely determine the policy into the future: this leads to a path dependency of institutions which can only be overcome with a good deal of political pressure to change the trajectory of institutional development (Pierson 2000a; Peters 2005; Schmidt 2006b). Historical institutionalism sees institutions as constraining rather than enabling political action “to the point that only the

intervention of exogenous factors, which typically rearrange (or punctuate) previously immutable structures can bring about change" (Blyth 1997: 230). War and economic depression are often used as examples. As a response to the problem of how to conceptualise change by agents in a less ad hoc manner, historical institutionalists came to see ideas as crucial for understanding the origins and nature of change. Historical institutionalism acknowledges the crucial role that ideas play in shaping policy (e.g. through the work of Hall (1993) on political paradigms in economic policy making) by constraining the limits of acceptable action by government (Peters 2005: 75).

Sociology has a long tradition of dealing with institutions, going back at least as far as the work of the German sociologist Weber on the 'rational' bureaucracy of modernising societies (Peters 2005). There is a rich literature on organisational theory in sociology and scholars in this field built on institutional arguments, for example through the work of Merton, Selznick and Parsons (Scott 2008). Due to the strong influence of organisational theory the sociological literature often fails to distinguish clearly between organisations and institutions (Peters 2005). Schmidt states that "[s]ociological institutionalism sees the state as socially constituted and culturally framed, with political agents acting according to the 'logic of appropriateness' that follows from culturally specific rules and norms" (Schmidt 2006b). According to this logic new institutional practices are adopted not because of means–ends efficiency calculations but to enhance the social legitimacy of the organisation (Hall and Taylor 1996: 949). Cultural norms and rules give meaning to these practices. Sociologists would reject the rational choice assumption of utilitarian rationality and exchange it for an emphasis on norms, cognitive frames and meaning systems that guide political action.

Despite the valuable contributions that scholars working within these three strands of work have made, a crucial question relevant for the aims of this thesis is posed by John:

> "But does institutionalism explain policy change? In part, it does, but institutionalists find it harder to explain bursts of change, such as improvements in policy performance or the imminence of policy disasters, which are some of the crucial issues. Institutions can account for change when they adapt, especially in relation to one set of interests and policy concerns.

> When new pressure groups rub up against established sets of institutions, the resultant change may be greater than would be expected… In spite of these nuances, it is not certain that institutional approaches offer an all-encompassing theory of policy change, mainly because institutions are better at explaining the dampening rather than the amplifying of political processes. They are generally stable, which means they set out routines and constrain human action" (John 2003: 484).

A variety of scholars agree with this assessment and further criticise that institutionalist accounts often rely on untheorised external shocks to explain change (Hay 2002; Fischer 2003; Hill 2005; Peters 2005; Schmidt 2006b). This leads to a neglect of agency and a tendency towards structuralism in some cases (Hay and Wincott 1998). Schmidt has argued that the "rational choice institutionalists' emphasis on the self-interested nature of human motivation, especially where it is assumed to be economic self-interest, is value-laden, and can appear economically deterministic" (Schmidt 2006b: 5). Hall and Taylor (1996: 942) argue that in particular historical institutionalists emphasise periods of continuity in which institutions develop along path-dependent trajectories which are punctuated by 'critical junctures'. They have difficulties in explaining what causes these junctures and often stress the impact of economic crises or political conflicts. Sociological institutionalism has been criticised for being 'bloodless' (Hall and Taylor 1996) and culturally deterministic (Schmidt 2006b) because of its focus on rule-following rather than rule-creating action and its neglect of political processes of contention.

In response to this issue some scholars have paid more attention to how discourses can create opportunities for change within an institutional context. This line of thinking will be explored in the next section.

2.3.2 Discursive institutionalism

Recognising the shortcomings of the established institutionalist approaches, a number of scholars have built upon the foundations of those three approaches to sketch out a discursive institutionalist approach (Campbell 2001; Hay 2001; Schmidt and Radaelli 2004). This fourth institutionalism can be seen as a more radical branch of the sociological

and historical institutionalisms (Nullmeier 2006), “providing a framework for the analysis of policy change that complements the traditional three institutionalisms” (Schmidt 2003: 127).

For example, Hay suggests, partly following (Hall 1993), that in moments of perceived crisis paradigm shifts can alter the trajectory of institutional evolution (Hay 2001). His work is concerned with the dynamic relationship between structure and agency and the material and the ideational. Hay focuses on the processes of institutional and ideational change and asks “under which conditions paradigms are consolidated, challenged and replaced” (Hay 2001: 198). He aims to shed light on the dynamic relationship between institutional context and institutionalised conduct. Similarly, (Campbell 2001) is interested in understanding different types of ideas and how they influence policy making and Schmidt sees ideas and discourse as one important explanatory factor of policy and institutional change (Schmidt 2003). According to Schmidt, discursive institutionalism “considers the state in terms of the ideas and discourse that actors use to explain, deliberate, and/or legitimize political action in institutional context according to the ‘logic of communication’” (Schmidt 2006b). Campbell points out that the rise and fall of ideas is often politically contested and thus a highly conflictual process (Campbell 2001). He also argues, similarly to Schmidt, that it is not ideas on their own which change policy making outcomes but the interaction of ideas and interests. Schmidt claims that discourse can be *a* cause for policy change as “it may enable public actors to reconceptualise interests rather than reflect them, to chart new institutional paths instead of simply following old ones, and to reframe cultural norms rather than only reify them” (Schmidt 2003: 129). Discourse can therefore be the most influential factor at times but this is seen as an empirical question.

Discursive institutionalism has the claimed advantage of having a greater ability to explain processes of change compared to the other three strands within this literature. In discursive institutionalist thought, while institutions and historical traditions provide a structure, the dynamics of change are traced by focussing on ideas and discursive interactions. Contrary to the other ‘new’ institutional approaches the focus is more on the enabling than the constraining side of institutions. Schmidt’s work emphasises this dual nature of institutions.

The discursive institutional perspective:

- is dynamic whereas the other three institutionalist approaches have difficulties explaining policy and institutional change;
- provides a heuristic for going beyond 'politics as usual', which is necessary for the analysis in this thesis because transformations of electricity systems towards sustainability go against the interests of a variety of actors;
- pays attention to discourse and policy communication;
- pays attention to the enabling dimensions of institutions.

Schmidt's discursive institutionalism can contribute to the analytical framework of this thesis because, similarly to Hajer, the approach is primarily concerned with ideas and how they are communicated through discourse to explain policy and institutional change (Radaelli and Schmidt 2005: 10). As has been argued above, Schmidt's discursive institutionalism also specifically sheds light on the dynamics of these change processes. Schmidt emphasises that political actors need to create an interactive consensus for change through communication (Schmidt 2001), which is very relevant for the question to be answered in this thesis. Successful efforts to make electricity systems more sustainable will need such an interactive consensus to be created as transitions are multi-actor processes and cannot be steered in a top-down way (Rotmans, Kemp et al. 2001a).

2.4 Analytical Framework: Bringing together Hajer and Schmidt

Both the policy studies and the new institutionalism literatures reviewed above clearly point to the importance of discourse and their institutional contexts for policy and institutional change. By combining concepts from both strands of work this thesis' theoretical framework is developed in order to be able to analyse the politics of new policy initiatives to steer transformations of the electricity system. Both the work of Hajer on the analysis of discourse coalitions in environmental politics and Schmidt on policy and institutional change in nation states in response to globalisation and Europeanisation are particularly fruitful in this endeavour because they combine attention to the politics and dynamics of

political change, highlighting opportunities for political change, with an institutional perspective, highlighting the constraints of political change. Both scholars focus on ideas and discourses to explain political change and have done comparative work across nation states using their respective frameworks.

Moreover, elements of both frameworks are combined in this thesis to counter the respective weaknesses of the other approach:

- Compared to Schmidt, Hajer pays more explicit attention to discourse coalitions as important actor groups in discursive interactions.
- Although Hajer emphasises that the institutional context of discourse is important, this context is somewhat undertheorised in his work and he does not offer a framework for analysing how institutions matter and when: in Schmidt's view such an approach risks appearing highly voluntaristic unless the structural constraints derived from the three 'new' institutionalisms are included (Schmidt 2006b).
- Schmidt emphasises the role of discourse not only in political coordination within policy elites, as in Hajer's work, but also in terms of the political communication with the public. She claims that where analysis takes ideas seriously, it has focussed on the coordinative dimension whereas the communicative dimension has not been systematically researched (Schmidt 2007).
- Schmidt's distinction between normative and cognitive dimensions of a discourse presents a helpful distinction which Hajer's work lacks. This distinction helps to shed light not only on why a discourse is cognitively convincing, but also on why it is normatively appealing for actors.
- Hajer has a more explicit focus on how discourses define policy problems. This aspect is neglected in Schmidt's work who often sees policy problems as a given, for instance in the form of external pressures such as globalisation to which national policies and institutions need to be adapted (see e.g. Schmidt 2000; Schmidt 2003). Hajer understands such a pressure as being socially constructed and his approach helps to understand how certain framings of the situation affect political responses.

In the following the main conceptual building blocks of the analytical framework of this thesis are described.

2.4.1 Storylines

Hajer developed his discourse analysis framework to study the influence of ecological modernisation on the regulation of the problem of acid rain in the United Kingdom and the Netherlands (Hajer 1995). Similarly, this thesis will analyse the influence of discourses in shaping new government initiatives to transform electricity systems towards sustainability. Based on Hajer this thesis argues "that the developments in environmental politics critically depend on the specific social construction of environmental problems" (Hajer 1995: 2). This thesis attempts to shed light on the political process, on how the problem of making electricity systems more sustainable has been defined, and on what political consequences this has in terms of policy and institutional change. Analogously to Hajer, this thesis will examine "how the emergence and acceptance of such a conceptual language was taken up in actual practice and what sort of institutional innovations it brought about" (1995: 4). An important role in this process is played by storylines as new storylines which re-order our understanding of policy problems can create political change by the re-ordering of meaning (Hajer 1995: 56).

The core idea of storylines is that argumentative processes are very complex and that actors often evoke certain storylines rather than refer to the whole discourse about, for example, climate change. A storyline is thus a short-cut for a wider discourse which is used as a frame of reference by actors. For Hajer storylines are a "generative sort of narrative that allows actors to draw upon various discursive categories to give meaning to specific physical or social phenomena" (Hajer 1995: 56). The key function of storylines is to "suggest unity in the bewildering variety of separate discursive component parts of a problem like acid rain" (ibid.). Storylines are metaphors and facilitate the reduction of complexity and create possibilities for problem closure. They help to cluster knowledge, help actors to position themselves and ultimately fulfil an essential role in the formation of

discourse coalitions (Hajer 1995: 63) (see next section for details on discourse coalitions). As storylines become more accepted they give a certain permanence to a debate.

The word ‘storyline’ is an umbrella term for metaphors, analogies, historical references, clichés, and appeals to collective fears or feelings of guilt. An example given by Hajer is the ‘acid rain’ storyline, which is a narrative that relates industrial emissions to the dying of fish and forests and the corrosion of buildings. It constructs a powerful causal story which injects urgency (forest dieback) and blame into the political arena (polluting industry) and thus gives rise to new political claims.

The concept of storylines is refined for the purpose of this thesis by introducing an important distinction into the analysis. Schmidt argues that for a discourse to be successful it needs to be cognitively convincing and normatively appealing (Schmidt 2001). Also, other authors find this a useful distinction (Rueschemeyer 2006). The same applies to storylines as shorthands for more expansive discourses.

In terms of the cognitive dimension the ideas of a discourse need to define the policy problem to be solved, and propose adequate policy solution, which is often done through reference to techniques and principles of scientific disciplines and justified in terms of a ‘logic of necessity’. For Schmidt the cognitive interpretation of ‘facts’ rather than truth is at issue and the relevance and applicability of ideas matters (Schmidt 2006a: 251); an example of this being cognitive arguments used to justify welfare state adjustments in small states, such as making reference to external causes like growing competition from other European countries or also globally, and to internal causes such as demographic changes which jeopardise the architecture of the welfare system (Schmidt 2003: 135).

To be normatively convincing the ideas of a discourse need to appeal to existing or emerging norms and values. Schmidt argues that ‘good’ normative arguments demonstrate the appropriateness of policy ideas by appealing to norms and principles of public life. Their success depends on whether they can appeal to emerging or long-standing values (Schmidt 2006a: 252). Similarly, Goldstein argues that ideas that ‘fit’ with existing ideas

gain persuasiveness, while “ideas that do not ‘fit’ with underlying social values are unlikely to find support among political entrepreneurs and the attentive public” (cited in: Yee 1996: 90-91). In the case of welfare state adjustments, for example, governments try to argue that the reforms do not violate accepted norms such as universalism, equality or social solidarity. Discourses can also appeal to competing values that have broad moral support such as neoliberal arguments promoting individual responsibility for welfare provision (Schmidt 2003: 135).

The storyline is a particularly useful concept for the analysis in this thesis because of its emphasis on the opportunities for creating policy and institutional change (see e.g. Lovell, Bulkeley et al. 2009). Institutions and their continuous reproduction through discourses can be challenged when critical tensions in the dominant storyline appears, coupled with the emergence of counter-storylines based on new problems, new knowledge or external shocks. In this situation “[f]inding or reconstructing the appropriate storyline becomes a central form of agency for the political actor” (Fischer 2003: 88).

2.4.2 The interactive process of policy construction and communication

While the storyline concept focuses on the substantive content of ideas, it is also important to consider discourses as interactive processes through which ideas are conveyed (Schmidt 2001: 249). Schmidt and Radaelli (2004: 183) argue that “this interactive dimension is essential because it brings both agency and institutions back into the analytical framework of analysis”. Hajer sees the argumentative interaction as “a key moment in discourse formation that needs to be studied to be able to explain the prevalence of certain discursive constructions” (Hajer 1995: 54).

Schmidt (2003) distinguishes two closely interlinked processes in these interactions aimed at generating and legitimising ideas which involve different actor groups. Policy ideas are generated and constructed through communication between key policy actors. This is what Schmidt terms the *coordinative discourse*. In these processes the main actors are policy actors: experts, organised interests, civil servants, elected officials, and public figures who

coordinate the construction of policy often using ideas conveyed by ‘policy entrepreneurs’ and/or developed in discursive communities such as discourse coalitions. The coordinative discourse is often closed to public view (Schmidt 2006a: 254).

However, getting policy ideas deliberated and legitimised, at least in democratic political systems, requires political communication with the public about policy problems and their envisaged solutions. This is what Schmidt terms the *communicative discourse*. She argues that the main actors in this process are political actors – politicians, spin doctors, campaign managers, government spokespersons, and party activists who communicate the ideas developed in the context of the coordinative discourse to the public. This includes the ‘weak’ public made up of citizens as well as ‘informed publics’ made up of ‘organised private persons’ or policy forums made up of community leaders, activists, experts, organised interests and media. In this process ideas are not only communicated in one way but they are discussed, deliberated and ideally modified (Schmidt 2006a: 254-255). The coordinative and the communicative discourse are closely intertwined, might happen sequentially or in parallel and are only separated heuristically to gain analytical clarity about these two different dimensions of discursive processes.

In both of these processes discourse coalitions play an important role. Hajer defines discourse coalitions “as the ensemble of (1) a set of story-lines; (2) actors who utter these story-lines; and (3) the practices in which this discursive activity is based (Hajer 1995: 65). Storylines are the ‘discursive cement’ that holds a discourse coalition together through the production of ‘discursive affinities’ (Hajer 1995; Ockwell and Rydin 2006). Hajer describes how discourse coalitions are formed “if previously independent practices are being actively related to one another, if a common discourse is created in which several practices get a meaning in a common political project” (Hajer 1995: 65). Hajer emphasises that discourse coalitions compete for influence on policy design and implementation. He sees the argumentative interaction as “a key moment in discourse formation that needs to be studied to be able to explain the prevalence of certain discursive constructions” (Hajer 1995: 54). Discourse coalitions can stretch from politics, to science, regulators, NGOs, journalists and academics. It is thus important to focus the analysis not only on governmental actors.

In contrast to Sabatier's advocacy coalition framework (Sabatier 1993) actors in discourse coalitions are not bound together by shared belief systems but by a shared set of storylines in the context of an identifiable set of practices (Hajer 1995; Fischer 2003: 107). This also distinguishes them from, for example, interest-based policy networks which have been analysed mainly using power dependence theory or rational choice approaches (Rhodes 2006). Discourse coalitions form in the struggle for hegemony amongst actors who possibly perceive their position and interests through widely differing discourses. Bulkeley has shown in her case study of Australia that despite differences in beliefs and interests, "actors create coherent storylines about the climate change problem by drawing on the arguments, example, evidence, and legitimacy of others in the coalition, which are used to press for policy change" (Bulkeley 2000: 739).

Schmidt herself points out that it is often difficult to separate ideas from the processes through which they are generated and constructed (coordinative dimension) and publicly presented and deliberated (communicative dimension) (Schmidt 2003), but this distinction still seems to be a useful heuristic complementing the analysis of storylines which focus on the content of ideas.

2.4.3 The institutional context

As emphasised in both Hajer and Schmidt's work, discourses as well as opportunities and constraints for political change are influenced by the institutional context. The basic argument of institutional approaches is that institutions do matter and that "something about institutions…explains the decisions that governments make" (Peters 2005: 164). Institutions are widely understood as formal and informal rules, including formal structures in government (such as bureaucracies and legislatures), but also informal societal structures (such as interest representation in policy formulation and implementation, and party systems) which influence policy making (see e.g. Lijphart 1999; Schmidt and Radaelli 2004; Peters 2005). In Schmidt's words institutions "whether understood as interest-based, historically evolving, or socially constituted rules of behaviour – frame the discourse,

defining repertoires of more or less acceptable (and expectable) discursive interactions" (Schmidt 2003: 129-130). Writing about the new institutional analysis of the effects of ideas on policy, Yee similarly argues that institutions influence which ideas gain political access: "The organization of the political system as a whole affects the entry of ideas into the policymaking process by allowing or restricting the access of social groups to political leaders and bureaucratic officials" (Yee 1996: 92). The institutional norms and arrangements "set the parameters of what people talk about as well as of who talks to whom in the process of policy-making" (Schmidt and Radaelli 2004: 197). The overall argument is that the formal institutional system has an influence on how policies are made and which actors can take part in the processes of policy formulation and implementation.

However, it is also important to note that despite looking at the characteristics within a nation state, international institutional rules (e.g. EU rules) play an important role in policy making. There might also be major institutional differences in different policy areas. Indeed one of the main contributions of the policy studies literature is the idea that decision-making varies vastly from policy sector to policy sector (John 2003: 482). So while some dimensions of the institutional context might be determined by the national context (such as the parliamentary system), others might differ according to the specific policy area and can also change over time (Schmidt 2006a: 225 also acknowledges this point). It is thus necessary in the analysis of the case studies to pay attention to both the national institutions and international rules as well as sector-specific rules and arrangements.

Apart from the formal institutional arrangement there are also informal institutions which play a role in policy-making processes such as norms, practices and beliefs which constitute the 'rules of the game'. Unruh (2000), for instance, mentions norms, values and customs as examples of informal institutions. Another example might be organisational routines. John argues that institutions are in part formal arrangements "but there are also the practices embedded in formal organizational arrangements, which are sometimes called standard operating procedures" (John 2003: 483-484).

These informal ‘rules of the game’ on the one hand shape more or less acceptable ideas and discursive interactions (Schmidt 2008). This is very much in line with Hajer who has argued that institutions shape what can be said meaningfully (Hajer 1995) or Fischer’s notion that actors “are constrained not only by conventional understandings and agreed-upon rules of the game but also by mutual positioning, existing institutional routines, and changing contexts” (Fischer 2003: 106). On the other hand institutions also need to be ‘discursively upheld’ as they do not have a cognitive capacity of their own (Schmidt and Radaelli 2004) and should be viewed as incentive structures rather than actors (Immergut 2006: 567).

One key finding of the institutionalist literature is that institutions are difficult to change because they are path dependent. Path dependency contributes to the stability of institutions by making reversals unattractive as actors have made commitments on the basis of existing rules in the expectation that these will continue to exist (Pierson 2000a; 2000b). Path dependence, however, not only applies to institutions, “but the very ideas on which they are predicated and which inform their design and development, that exert constraints on political autonomy” (Hay 2006: 7). This is what Hay calls ‘ideational path dependence’. Ideas solidified in norms and rules present ‘cognitive filters’.

Schmidt (2008: 313) argues that the other three new institutionalist strands have made institutions overly ‘sticky’, whereas the turn to ideas and discourse is an effort to ‘unstick’ institutions. Rational choice, and sociological and historical institutionalism are unable to explain path-shaping rather than path-dependent institutional change (Hay 2006). However, from a discursive point of view, institutions are seen as being constituted by practices and Hajer argues they are in need of discursive ‘software’ to operate and produce effects. According to Hajer, “institutions are only powerful in so far [as] they are constituted as authorities *vis-à-vis* other actors through discourse” (1995: 51). Hajer refers to the duality of agency and structure and argues that change comes about through the interaction between agents and structures (1995: 58). Schmidt would agree with this line of thinking and points out that actors have ‘background ideational abilities’ as well as ‘foreground discursive abilities’:

> "Agents' background ideational abilities enable them to act in any given meaning context to create and maintain institutions while their foreground discursive abilities enable them to communicate critically about those institutions and so to change or maintain them" (Schmidt 2008: 322).

There is therefore a recursive relationship between the institutional context and discourses. Institutions play a constraining (control and constrain behaviour) as well as enabling (support and empower action) role (see e.g. Scott 2008: 50) and discourses can solidify into new institutional arrangements (Hajer 1995). As Hill eloquently puts it: "Political activity is not just a game played within rules, it also involves efforts to renegotiate those rules" (2005: 83).

2.4.4 Change in policy practices and institutions

Thus, the important question is when a discourse becomes dominant and makes a difference in terms of changes in policies and institutions? As outlined above, usually several competing discourse coalitions wrestle for political influence. Hajer has suggested a two-step procedure for assessing the influence of a discourse: is the discourse being used by many people to conceptualise the world (discourse structuration)? Has the discourse solidified into institutions and organisational practices (discourse institutionalisation)? Hajer argues that if both criteria are fulfilled a particular discourse has become dominant (Hajer 1995: 60-61). I will now turn to these two concepts.

As the discourse analytic framework developed by Hajer is not only based on textual analysis of what is said by whom and why, but also includes the practices and institutional changes, it is essential to assess the importance of a discourse on those practices. The first condition necessary for this to happen is that a discourse has to become so important that it cannot easily be ignored by policy actors when they discuss an issue. Hajer posits: "We will speak of the condition of discourse structuration if the credibility of actors in a given domain requires them to draw on the ideas, concepts, and categories of a given discourse" (Hajer 1995: 60). Structuration thus describes the extent to which a discourse becomes credible in policy debates: the storylines and agents of a discourse coalition achieve discursive hegemony by achieving coherence and credibility (Bulkeley 2000: 735). Hajer

talks of discourse structuration when the discourse starts to dominate the way a social unit conceptualises the world according to this discourse. The more actors use a certain definition of the world according to a specific discourse, the more powerful the discourse is.

The second step for assessing the influence of a discourse is to look at its institutionalisation. The institutionalisation of discourses occurs when a discourse solidifies in particular institutional arrangements and concrete policies (Hajer 1995: 61). Tracing discourses in policy documents and reconstructing storylines thus needs to be combined with the analysis of its effects in terms of changing policies and institutions. Dryzek similarly includes effects on institutions and policies as important items for assessing the effects of discourses (Dryzek 1997: 20).

In Hajer's account of the emergence of ecological modernisation in the Netherlands it was this phase in particular that was problematic. After the eco-modernist storyline had managed to get integrated into the mainstream (discourse structuration) it failed to produce substantially different outcomes because of various "institutionally embedded micro-powers" (Hajer 1995: 175). Hajer's analysis highlights a number of mechanisms such as 'ambivalent storylines', the role of 'disjunction markers', 'symbolic politics', the need for 'sensory experience', the discursive creation of 'macro actors', the 'social construction of ignorance', 'black boxing', positioning and 'mutual functionalisation' as well as structured ways of arguing (Hajer 1995: 268-275). Bulkeley similarly concludes from her analysis of storylines in the Australian climate change debate that while a degree of discourse structuration took place around the no-regrets storyline, "its institutionalisation has been effectively limited by traditional concerns to ensure that demands for energy are met and business continues as usual" (Bulkeley 2000: 745). These points show that new problem definitions embedded in a particular new storyline do not necessarily, even if shared among a variety of actors in a policy area, translate into policy and institutional changes. The cross-case analysis in chapter 6 will return to such mechanisms in more detail.

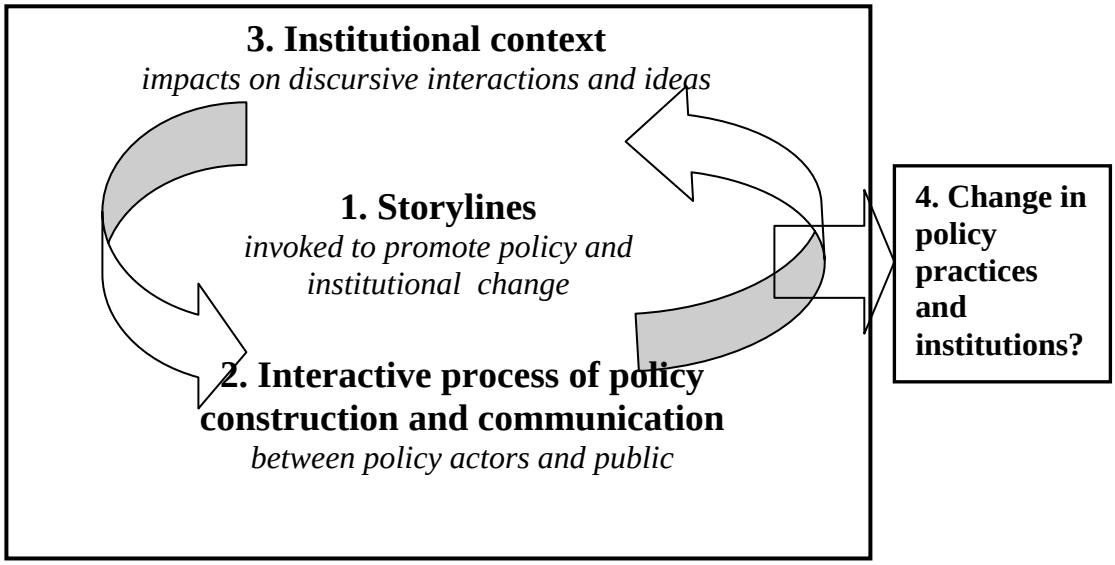
The empirical analysis of the two case studies will thus critically assess whether in practice the new storylines led to changes in policies or institutions. As the main interest of the

thesis is the effects of particular discourses on policy initiatives to transform the electricity system, the analysis will focus on the effects of the discourses on policy practices and institutions.

2.4.5 Summary of the analytical framework

Combining concepts from the work of Hajer and Schmidt, this thesis uses the storylines concept to shed light on the normative and cognitive ideas used to promote policy and institutional change in the two case studies. By looking at the discourse coalitions involved in the interactive process of policy construction and communication it pays attention to agency. This focus on actors and agency is complemented by considering the institutional context in which the discursive interactions occur. The thesis finally assesses whether and how the analysed processes led to change in policy practices and institutions.

Figure 2: Analytical Framework of the thesis



Own illustration, based on (Schmidt 2003: 134) and (Hajer 1995)

2.5 Discussion of challenges confronting the Analytical Framework

Any analytical framework has ‘weak’ or ‘blind’ spots and can only investigate a particular part of the complex social world. It is therefore important to be transparent about, and reflect on, the strengths and weaknesses of the chosen analytical framework.

Although the theoretical position of this thesis is open to the claim that discourses matter it does not argue for ‘ideas all the way’. First, whether discourses matter for policy and institutional change in particular instances needs to be analysed empirically. Second, it is clear that more traditional variables like material resources play a role in policy processes but cannot ex ante be considered as sufficient explanatory factors, as argued above. This thesis agrees with Bulkeley who argues that “An acknowledgement of the roles of discourse, negotiation, and learning within the policy process does not deny the importance of considering interests and resource interdependencies” (Bulkeley 2000: 745). Thirdly, it is acknowledged that one limit of the influence of discourse is the fact that governments in capitalist economies have to fulfil a number of basic functions irrespective of discourse, most importantly ensuring continued economic growth: however, as Dryzek suggested, the relative influence of discourse and this kind of economic constraint on government policies should be investigated empirically for particular cases (Dryzek 1997: 12).

One particular challenge is posed by the essentially nation-level focus of the analysis which makes it difficult to take international factors into consideration (such as cross-national epistemic communities, general technological trends, etc). While the definition of institutions allows international institutions to be integrated into the analysis the focus is clearly on national policy contexts. However, international factors such as EU state aid rules have been included in the analysis if they were mentioned by actors as playing a major role.

Sharp and Richardson point out that one limitation of discourse analysis is that it has difficulties linking analysis to material outcomes of policy (Sharp and Richardson 2001). This is true but is a more general problem in the field of policy studies. The complexity of

societies makes it difficult to causally link any particular policy instrument to a particular condition in society. Policy analysis thus often deals only with explaining policy outputs such as setting up new policy instruments or institutions, rather then policy outcomes. This is also true for this thesis. The analysis aims at explaining processes of policy and institutional change rather then the impact the analysed policy initiatives have on the electricity system, and therefore focuses on the processes as well as policy outputs. However, even if such an analysis was possible, it could not in any case be done yet as the sustainable transformation of electricity systems is a long-term process. It is thus too early to look at outcomes. Nevertheless, the conclusions will also attempt to shed some light on the preliminary outcomes of the analysed policy initiatives based on indicators such as reduction in carbon emissions.

3 Methodology

The thesis undertakes case studies of two selected policy initiatives aimed at promoting 'system innovations' to achieve more sustainable electricity systems in the UK and the Netherlands. It uses a process tracing method. This chapter justifies the research design of the thesis and describes the methodology used.

3.1 Studying discursive politics: Ontological and Epistemological Assumptions

In order to be able to judge the suitability of the chosen research design and methods for the analysis presented in this thesis, it is necessary to clarify the main ontological and epistemological assumptions of the work as these have implications for the methodology. To do so the differing assumptions underlying Hajer's and Schmidt's work will be outlined before positioning this thesis in the 'critical realist' tradition.

3.1.1 Ontology

In terms of ontology, "Scholars have beliefs about what the social world is made of and how it operates, and these beliefs influence their choices about how to construct and verify knowledge statements about that world" (Bennett and Elman 2006: 456-457). Most important for this thesis are the following categories:

- Discourses
- Interests
- Institutions
- Politics.

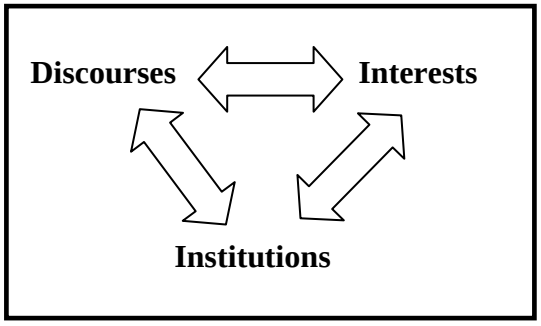
As explained above, the underlying assumption is that discourses and interests are not independent of each other but have a recursive relationship: interests can influence discourses but discourses can also shape the understanding of what the interests of an actor are, especially in times of uncertainty. Following Blyth's argument it is not the direct

material interests which shape actors behaviour but their particular perceptions of their material interests, and so ideas render interests 'actionable' (Blyth 2002: 39). However, while it is important not to see discourses as a reflection of material interests, it is also important not to subscribe to a voluntarist idealism. Instead, a recognition is required

> "of the complex interaction of material and ideational factors. Political outcomes are, in short, neither a simple reflection of actors' intentions and understandings nor the contexts which give rise to such intentions and understandings" (Hay 2002: 208).

Similarly, discourses and institutions have a recursive relationship as well. As outlined above, discourses are to some extent shaped by existing institutions (Hajer 1995; Schmidt and Radaelli 2004), but they can also chart new institutional paths and shape the evolution of institutions (Fischer 2003: 44-45; Schmidt 2003).

Figure 3: Ontological Assumptions: Discourses, Interests and Institutions



From this ontological position the interplay of ideas, interests and institutions leads to policy change. Which of these three variables has the most effect in a given policy process at any point in time is an empirical question. In summary, discourses can both influence and be influenced by interests and institutions and are taken as the entry point for the analysis.

3.1.2 Epistemology

Schmidt's work on discursive institutionalism is aimed at demonstrating empirically the causal influence of ideas as explanatory of policy and institutional change (Schmidt 2006b).

Schmidt claims the same epistemological status for her 'discursive institutionalism' as the rational choice, historical or sociological institutionalism. It is a "framework for analysis that generates theories to be tested, but it is not itself a theory" (Schmidt 2003: 130). Nullmeier points out that despite the fact that Schmidt takes ideas seriously her work does not represent genuine social constructivism because she firstly retains the distinction between ideas and interests and secondly argues that when ideas do not transform interests they 'merely reflect' interests. Nullmeier is right in arguing that social constructivists "would insist that the reproduction of those schemata on which our interests (and institutions) are based is an achievement of communication and discourse" (Nullmeier 2006: 3).

Schmidt and Radaelli argue that:

> "our emphasis on discourse is compatible with different epistemological approaches to the study of the policy process, along a continuum from positivist approaches in which ideas may be mainly seen as reflecting the strategic interests of actors to constructivist approaches in which ideas are seen to constitute interests" (Schmidt and Radaelli 2004: 194).

Schmidt and Radaelli advocate an 'ecumenical view' as they argue for the analysis of ideational variables in the context of institutional and interest-based variables. In their view interests and discourse have a recursive relationship and which factor influences the other is an empirical question.

In Hajer's view those would be difficult to combine, since discourse for him defines interests (Hajer 1995). Hajer makes a much more definitive claim: in his view discourse always matters and interests and institutions do not exist independently of discourse. Interests are defined by discursive positioning and institutions are understood as past discourses 'solidified'. Hajer's research on the rise of the ecological modernisation discourse was aimed at explaining how the problem of acid rain was understood and tackled differently in the UK and the Netherlands (Hajer 1995: 105-106). Hajer wanted to demonstrate how social constructivism and discourse analysis "add essential insights to our analysis of contemporary environmental politics" (Hajer 1995: 3). Hajer and Versteeg maintain that the "analysis of discourses can help to illuminate why certain definitions do or do not catch on at a particular place and time and to explain the mechanisms by which a

policy does or does not come about" (Hajer and Versteeg 2005: 177). The discourse analytic epistemology is mainly focussed on "illuminating mechanisms in policy practice, rather than on trying to generate general laws" (Hajer and Laws 2006: 262). While general laws are rejected, theoretically informed explanations of mechanisms at work in policy processes are possible and desirable.

An important feature of epistemology is assumptions about the extent to which knowledge claims can be generalised (Hay 2002: 63). In line with Hajer and Schmidt's thinking, this thesis adopts the position that contingent generalisations[6] (as middle-range theories) are possible and that it is therefore possible to theorise about political processes; although the reflexivity of the social actors studied makes this more difficult than in the natural sciences. There are no immutable foundational truths in social life and predictive theory is not always possible (George and Bennett 2005).

To avoid accusations of relativism, this thesis adopts a 'critical realist' position. This school of thought proposes that reality exists independently of our ideas about it, that this is to an extent knowable, but that our access to reality is indirect and fallible; not everything can be verified by direct experience or observation (Proctor 1998). This position thus distinguishes between reality and our knowledge of it which necessarily carries cultural, political and other meanings. In critical realism knowledge

> "is neither wholly objective nor subjective but is in fact the result of interaction between subject and object: For critical realists, the truth-content of different ideas can be compared on a relative basis: some (social) explanations are more adequate representations of reality than others, though all are, by virtue of the dialectic (subject-object) nature of knowledge, always 'partial truth'" (Proctor 1998: 361).

Realist thought stipulates that causal mechanisms and their effects are not fixed, but contingent on the conditions in which they work (Sayer 1992: 108). Fischer describes a continuum from idealists (who exaggerate the role of ideas at the expense of economic and political interests) and materialists (who see ideas as rationalisations of interests) (Fischer

[6] George and Benett understand 'contingent generalisations' as specifying the conditions under which a proposed mechanism is at play and conditions under which it is overridden by other mechanisms (George and Bennett 2005: 8).

2003: 23-24). The 'critical realist' position advocated here constitutes a compromise between purely materialist, positivist positions which neglect the formative power of ideas, and entirely constructivist positions which reject an independent role for material reality outside of discourse (Proctor 1998). Adopting such a middle-ground position makes it possible to use a research method like process tracing, which will be explained in more detail below.

3.2 Process tracing as a method to explain policy change

Process tracing is an analytical approach to reconstruct a process and identify causal mechanisms in a complex phenomenon. According to George and Bennett,

> "In process tracing, the researcher examines histories, archival documents, interview transcripts, and other sources to see whether the causal process a theory hypothesizes or implies in a case is in fact evident in the sequence and values of the intervening variables in that case" (George and Bennett 2005: 6).

Process tracing can be used to test theories but can also be used to generate inductively new variables or hypotheses from the mechanisms observed in case studies (George and Bennett 2005: 7). In particular, when theories are underspecified, process tracing can be used to further develop middle-range theory by identifying one or more causal processes that explain an outcome. Process tracing fits with the 'critical realist' position outlined above as it does not aim at establishing general laws (if X, then Y) but at identifying contingent mechanisms (X leads to Y in this case, through steps A, B, C). The process tracing method does not necessarily rely on simple linear reasoning but, through detailed case studies, can take interacting causal variables into account (such as ideas, institutions and interests) for the explanation of complex processes.

Process tracing is the shared emphasis of historical and discursive institutionalism (Hay 2001: 213) and has recently received a lot of attention as a tool in qualitative research more generally (George and Bennett 2005; Bennett and Elman 2006; Checkel 2006; Tansey 2007). Process tracing has been suggested as a useful research strategy to empirically

demonstrate the causal influence of ideas in policy processes (Yee 1996; Campbell 2002; Schmidt 2006a). Yee argues that causal links between ideas and policies need to be explained in terms of causal mechanisms that render the meaning of ideas and beliefs compelling to actors (Yee 1996: 102). He suggests that such mechanisms can be identified through, for example, historical methods such as archival research, interviewing elite informants and participant observation. For discourse analysis scholars the task has been described as being to "reconstruct the policy process, gathering information about critical events and processes that explained the operation and effects of discourses" (Sharp and Richardson 2001: 205). Campbell also recommends careful process tracing as one method to explain how ideas affect policy making processes by showing "how specific actors carried certain ideas into the policy-making fray and used them effectively" (Campbell 2002: 29).

For these reasons this thesis follows a process tracing method in the context of a broader case study approach focussing on explaining the discursive politics of two selected policy initiatives. The case study approach will be explained in more detail in the following section.

3.3 Case study approach

The chosen methodology for this thesis is a case study approach. The following sections will thus explain the rationale for choosing this approach, justify the choice of the two cases used, and specify the unit of analysis.

3.3.1 Rationale for choosing a case study approach

This thesis is based on two case studies. The most commonly used definition of case studies is as follows: "A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between the phenomenon and context are not clearly evident" (Yin 1994: 13). Case studies are a good

methodology to use in situations when one is aiming at understanding complex and contemporary social phenomena (following Yin 1994), such as the politics of policy processes. Case studies are valuable because

> "the key to explaining how [policy] change comes about has to be grounded in a detailed contextual examination of the circumstances at play in specific cases. For this purpose quantitative methods have to take a back seat to qualitative research" (Fischer 2003: 108).

Case study research is a distinctively advantageous avenue for research that is explanatory, analysing a contemporary phenomenon over which the investigator has little or no control (Yin 1994: 9). This is the case with this thesis topic. Case studies enable the researcher to retain holistic and meaningful characteristics of real-life events (Yin 1994: 3), which is crucial in understanding the politics of policy processes. Case studies can be used to accomplish different aims, for example to provide description, test theory or generate theory (Eisenhardt 1989; Yin 1994; George and Bennett 2005) and are therefore a good strategy for this thesis as the research questions are partly aimed at providing empirically rich descriptions of the policy processes through which the two initiatives came about, but also at explaining the politics of such initiatives by looking at the interaction between discourses and institutions. Case studies are an appropriate research technique to answer questions of 'why' and 'how' as this requires tracing operational links over time (Yin 1994: 6).

Case studies have also been suggested as the central approach for carrying out process tracing in order to identify causal mechanisms (Gerring 2004: 348; George and Bennett 2005). Case studies have distinct advantages when it comes to "the development and testing of historical explanations and the detailed exploration of hypothesized causal mechanisms in the context of particular cases" (George and Bennett 2005: 6). They also enable the researcher to include both material and ideational variables and look at complex interaction effects between different variables (such as discourses, institutions and interests).

Case studies attract criticism concerning their ability to generate generalisable knowledge from the study of individual cases. The design of this thesis thus combines within-case analysis of two in-depth case studies with a comparative analysis across the two cases. This

has been argued to be the strongest means for drawing inferences from case studies (George and Bennett 2005: 18). Multiple case studies have the advantage of being more reliable than single case studies and are less prone to criticisms about the generalisability of findings from single case studies (Hakim 1987; Yin 1994).

3.3.2 Selection of cases

The choice of the two countries to be studied in this thesis (the UK and the Netherlands) is based on a strategic sampling approach. The rationale behind the case selection was not to choose representative cases of a given category but to choose cases which display a high degree of the phenomenon under study (Pettigrew 1990) and are polar in the sense of covering the 'known range and variation' (Hakim 1987).

In terms of high degree of phenomenon (in this thesis the fostering of 'system innovations' towards sustainable electricity systems), both countries adopted ambitious long-term goals with regard to future sustainable electricity systems early on compared to other European countries. The UK Energy White Paper of 2003 envisions a 60% cut in carbon emissions by 2050 (DTI 2003)[7] and the Fourth Dutch National Environmental Policy Plan of 2001 speaks of 40-50% cuts in carbon emissions by 2030 (VROM 2001). Other countries around this time adopted only short- or medium-term goals. The German National Climate Change Programme of 2000 for example only aimed to cut carbon dioxide emissions by 25% by 2005 and to increase the share of renewables to 10% by 2010 (BMU 2000: 7). Given these ambitious, long-term goals, both countries will need fundamental changes in their electricity systems. Both governments have developed new 'system innovation' policy initiatives to support the 'greening' of their electricity systems. Both cases are therefore 'special cases' in the sense that they adopted long-term goals and developed a new type of policy initiative aimed at 'system innovations' which differs from traditional innovation policy measures to support green product or process innovations. Both case studies are exemplars within this category – as far as the author of this thesis is aware they are the only

[7] This goal was later strengthened to 80% through the 2008 Climate Change Act.

two initiatives in both countries aimed at stimulating transformations of the electricity systems towards sustainability, which is the interest of this thesis.

What makes policy initiatives aimed at 'system innovations' special, apart from their level of ambition, is the fact that long-term, systemic change processes are particularly uncertain as they are non-linear processes (Rotmans, Kemp et al. 2001a; Geels 2005b). As has been argued above, this has been hypothesised to lead to a situation of uncertainty in which actors are uncertain about the best ways to safeguard their interests (Blyth 2002). This context would thus suggest that the cases are examples of 'most likely' cases in which the interaction between ideas and interests should be particularly evident if discourses do indeed have an influence on the politics of policy processes. If discourses cannot be shown to exert a transformative influence on interests and institutions in these cases, the discursive institutionalist claim would be significantly challenged.

In terms of their polarity, Hajer has already pointed to the very different discursive structures, policy styles and traditions in the two countries, which makes the comparison an interesting one (Hajer 1995: 6-7). Also, Voß suggested that governance patterns in shaping long-term change in electricity systems are remarkably different in those two countries (Voß 2004). The UK has a long tradition of neoliberal market-based policies in the energy sector (IEA 2007; Toke and Lauber 2007). The Netherlands is well known for its capacity for environmental planning, its innovations in environmental policy and for its consensual approach to target-group involvement and thus has a long tradition of cooperation between government and energy companies, for example through the use of covenants (Weale 1992; Hajer 1995; Gouldson and Murphy 1998; Jänicke, Kunig et al. 2000; Jörgens 2003). The Dutch 'polder model' of consensual decision-making between different societal groups and the state leads to a more corporatist governance approach (see e.g. Schmidt 2006a) although liberalisation has had an impact on the governance of the energy system, putting more emphasis on market mechanisms (Agterbosch, Vermeulen et al. 2004).

The differing national institutional contexts are an advantage rather than a problem for the contrasting of the cases as the thesis claims that the analysed phenomena of politics are

generic to the nature of the challenge of transforming electricity systems rather than to specific national political contexts or policy approaches. In this sense the choice of case studies therefore also follows a 'most different' case selection logic (Blyth 2002: 12). If everything else other than the independent and dependent variable is different in the two cases, this highlights the importance of the independent variables in explaining the processes under study.

The Dutch case study will analyse the Energy Transition which followed the Fourth National Environmental Policy Plan to achieve transitions in important societal sectors like energy. This policy initiative is explicitly based on socio-technical transitions theory as advocated by Dutch scholars and is explicitly aimed at influencing systemic change towards sustainability in energy.

The UK case study is not a straightforward comparative case study as there is no functional equivalent to the Dutch Energy Transition. However, the second case study serves as a contrasting reference point as similar concerns about the necessity for systemic change in the electricity system have led to an initiative which is markedly different from the one in the Netherlands. While the Dutch approach is based on a stakeholder process (transition platforms), the UK Government set up a private company limited by guarantee (the Carbon Trust) to 'accelerate the transition to a low carbon economy' (Carbon Trust 2007a). This initiative is also based on a systemic approach in that it combines attention to new supply technologies, as well as demand-side measures to increase energy efficiency and energy saving by firms and public authorities, management, regulatory, organisational and investment issues. It also includes information and policy advice as crucial for enabling this transformation to happen and thus pays attention to technical as well as social change.

Besides these theoretical considerations, the two cases are also of particular interest on their own terms as:

- the Energy Transition project and the Carbon Trust are both considered as unique and novel policy initiatives that are supposed to transform electricity systems towards sustainability and which have attracted international policy attention;
- the establishment of the Carbon Trust has not yet been analysed empirically at all;

- whereas the Energy Transition has received some attention, it was mostly analysed in comparison to the original transition management model. The emergence of the new approach and its impact on the implementation have not yet been analysed in depth.

3.3.3 Unit of analysis

The *unit of analysis* in both case studies is the selected policy initiative aimed at greening the electricity system. Although the unit of analysis is the policy initiative it is important to look not only at the governmental actors but also at the private and civil society actors involved in the problem-framing through new storylines, the processes of policy coordination and communication, and the structuration of the storyline which influenced the process of setting up and implementing these policy initiatives (discourse institutionalisation). The analysis of the two initiatives covers the time period between 1997/8 (when the ideas of the storylines were initially conceived) and 2006 and 2008 (when the interviews took place for the Dutch and the UK case respectively). Such an extended period of time is usually considered adequate to analyse processes of policy change (Sabatier 1993).

It has been argued that despite globalisation and the major role the European Union is playing, national technology and innovation policies are still central as they remain the most important and effective level of governance in this policy field (Dolata 2005). Others have also shown that in the field of environmental policy the nation state is still the most relevant actor and there are no tendencies to suggest that the state is 'withering away' (Jänicke 2005b). More specific to energy policy, despite recent attempts to establish an EU energy policy, policy in this field is mainly determined by national politics (Helm 2007; McGowan 2009).

3.4 Sources of Data Collection and Methods of Data Analysis

The analysis of the two case studies relies on three sources of data:

- review of relevant literature;
- analysis of relevant policy documents (including parliamentary records, policy reports, government publications);
- analysis of semi-structured interviews.

It triangulates between the information from those different sources, which is a recommended strategy for collecting evidence in case study research (Yin 1994; George and Bennett 2005). In the following sections these three sources of data will be discussed in more detail.

3.4.1 Relevant literature

The relevant literature includes publications on energy, technology, and environmental and innovation policy in the Netherlands and the UK. The literature review was based on a systematic search through the Web of Science using keywords such as energy, innovation, sustainability, transition, discourse, UK, Netherlands, etc. The IEA national energy policy reports for the UK and the Netherlands have also been a valuable source (IEA 2000; IEA 2002; IEA 2004a; IEA 2007). Important for the Dutch case study especially are publications which have looked at the implementation of the transition management approach in the energy domain (Hofman 2005; Kemp and Loorbach 2005; Kemp, Rotmans et al. 2007; Loorbach 2007; Nooteboom 2007; Dietz, Brouwer et al. 2008; Hendriks 2008; Loorbach and Kemp 2008) because they can help to triangulate the findings of this case study.

My involvement in a study of the Dutch energy transition led by Adrian Smith not only funded my fieldwork, but also helped shape my initial thinking and led to two co-authored publications (Kern and Smith 2008; Smith and Kern 2009)[8]. The joint project showed that

[8] The empirical material for these publications was gathered by the author of this thesis and he has been active in the detailed research design, was responsible for all the practical research effort, undertook the key preliminary analysis of research materials (documents and interviews) and co-authored two papers with Adrian Smith. The division of labour in the project was largely identical to the supervisor-research student relationship. The main difference was that the project was initially framed by Adrian Smith. The analysis of the 'Energy Transition' presented in this thesis is substantially different from the Smith and Kern 2009 paper. The analysis presented in this thesis tries to overcome some of the weaknesses of this paper, which did not

existing institutions as well as interests were important factors in explaining the policy processes and thus led me to draw extensively on the institutionalist literature in creating the framework presented above and to pay more explicit attention to the conceptualisation of the relationship between discourses and interests.

The UK literature on the subject is helpful in providing insights into, for example, the dominant framing of UK energy policy and the historical evolution of this policy area, but there are no publications directly analysing the Carbon Trust. The relevant literature has been thoroughly and systematically reviewed to inform the interviews and to triangulate conclusions derived from the analysis of the interviews and policy documents.

3.4.2 Relevant documents

The analysis of relevant government policy documents offers insights into how these policy initiatives are justified and explained. Policy goals and details of the implementation of the initiatives and subsequent institutional changes are provided. This includes reports from the respective ministries in both countries (mainly Environment, Economy, and Research), and the International Energy Agency, as well as from public organisations like the Carbon Trust, the National Audit Office in the UK and the Energy Transition Taskforce, SenterNovem, and government advisory councils such as the General Energy Council or the VROM council in the Netherlands.

For the UK case study the parliamentary records were searched for debates on the Carbon Trust (key word search in Hansard). The analysis of the Dutch case study could not make use of parliamentary records due to language difficulties. However, since the case has been investigated by several Dutch researchers the availability of these secondary sources

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explicitly differentiate between the content (ideas) and the processes of the discursive policy construction and neglected Hajer's distinction between discourse structuration and institutionalisation. In contrast, the analysis presented in this thesis relates the emerging storyline more explicitly to the dominant discourse; makes use of more empirical detail, especially about the institutionalisation, to see which practices changed and why; and uses a broader framework which combines attention to discourses (Hajer) with attention to the institutional context (Schmidt) because the initial paper had shown the difficulties of institutionalising this new storyline. This thesis also pays explicit attention to the discursive mechanisms which shaped the policy initiative.

compensates for the lack of access to primary information. Relevant documents also include policy evaluations by public authorities in English or independent organisations as well as documents authored by stakeholders (such as NGOs, industrial associations, etc.) It is important not to privilege official discourses by limiting the analysis to official policy documents only, but also to look at opposition and resistance and their rationalities (Oels 2005: 193). Similarly, Dryzek has argued that in assessing the effects of a discourse it is important to look at the arguments of the critics of a discourse (1997: 20). The analysis therefore relies not only on official documents but also includes documents from stakeholders and critical voices. The relevant documents have been thoroughly and systematically reviewed to inform and triangulate the expert interviews, identify storylines and gain insights into how the discourses have or have not shaped changes in policies and institutions.

3.4.3 Semi-structured interviews

Both case studies also make use of semi-structured interviews. A snowballing sampling method was used (see Arksey and Knight 1999; Tansey 2007). Tansey has argued that because the goal of process tracing is to

> "obtain information about well-defined and specific events and processes, the most appropriate sampling procedures are thus those that identify the key political actors – those who had the most involvement with the processes of interest" (Tansey 2007: 765).

Instead of random sampling the aim is to include the most important actors who were involved in the process to be studied. Generalisation from the actors interviewed to a large population of actors is not what is aimed for. Rather, the research was interested in their personal accounts of these processes and what role they played in them. To be able to include first-hand accounts of actors involved in the processes under investigation is one of the main advantages of elite interviews compared to the analysis of the official version of events found in documents (Tansey 2007). Interviews with key actors can shed light on the informal processes underlying decision-making processes (George and Bennett 2005). Also, Hajer, Schmidt and Radaelli point to the importance of interviews for exploring causal

sequences (Schmidt and Radaelli 2004: 205). Interviews are particularly useful to get a better understanding of the meaning that interviewees attach to particular events (Kvale 1996: 105).

The snowball approach used for the purposes of this thesis started from existing contacts with researchers and civil servants in both countries who helped to identify key actors involved in the particular policy processes being studied. Interviewees were then asked for further suggestions for other important actors involved in the area under research, and these were then contacted if two or more interviewees put forward their names. This process was stopped when interviewees began to repeat the names of interviewees already contacted. In parallel to this, documents were screened for names of actors mentioned as important. To avoid the selection being skewed by interviewees suggesting actors with similar characteristics and views, and in order to interview a diverse set of actors, an attempt was made to create a balance based on two characteristics. Balance can be sought by deliberately seeking opposing positions (Sharp and Richardson 2001), so by including 'insider' and critical 'outsider' views on the two initiatives it is hoped that a balance in the representation of the policy processes can be achieved. Secondly, balance was sought by seeking actors from different domains of society: government, private firms, academia and non-governmental organisations (NGOs) such as environmental or other lobby groups.

Between January and May 2006, 27 semi-structured interviews were conducted in the Netherlands with actors involved in the implementation of the 'energy transition' project, or those who were familiar with it but were not directly involved, from government, industry, civil society and research organisations. 26 semi-structured interviews were conducted for the UK case study between October 2007 and March 2008. These were with current and former employees of the Carbon Trust and key stakeholders from government, research, business and environmental groups. For a list of interviews conducted, see Appendix A.

The interviews were conducted as semi-structured, exploratory interviews to allow for openness, while maintaining a focus on the key issues to be addressed. Exploratory

interviews introduce an issue and then follow up on the interviewees' answers, seeking new information about and new angles on the topic (Kvale 1996: 97). Key issues were:

- how the interviewees explained the rationale for the new policy initiative and what policy problem they were hoping to tackle;
- why the particular approach was chosen;
- how the new initiative came about and which key actors were involved;
- experiences in the implementation of the policy initiatives;
- reflections on the successes and problems of the initiatives,
- and potential policy and institutional changes that followed from it.

The interviews were based on a flexible schedule depending on the role of the interviewee (for an example of this, see Appendix B), which included a sequence of themes to be covered as well as suggested questions. At the same time, however, there was openness to changes of sequence and form of questions in order to follow up on the answers given (see Kvale 1996). Most of the interviews took place face to face but some were conducted over the phone. All interviews have been recorded and transcribed. All interviewees were assured that they would remain anonymous to enable them to speak openly.

3.4.4 Methods of data analysis

In accordance with Hajer's suggestion the steps detailed below were followed in conducting the analysis. In the document analysis the research looked for structuring concepts, ideas and categorisations as well as the use of storylines, metaphors, etc. This analysis yields "a basic notion of the process of events as well as the sites of discursive production" (Hajer 2000). The analysis of the interview data can be used to generate more information on causal chains and to gain a better understanding of the meaning of particular events for the interviewees which, for example, have led to a re-framing. This can lead to the identification of key events which are essential for understanding the discursive dynamics.

If meaning is central to the study of policy processes, this has implications for the methods of empirical analysis because "as meanings are not directly observable, the realm of meaning has to be approached through reflection and interpretive analysis" (Fischer 2003:

139). This information on meaning and causal mechanisms is useful to reconstruct the discourses which actors are drawing on and to analyse particular cognitive shifts (reframing) which are of interest for the analysis. To this end, the researcher has to try "as it were, to get inside the heads of the particular players in an effort to figure out the thinking behind the actions at issue" (Fischer 2003: 141).

The analysis is therefore based on meaning interpretation inspired by hermeneutical philosophy. Kvale describes this approach as follows:

> "The researcher has a perspective on what is investigated and interprets the interviews from this perspective. The interpreter goes beyond what is directly said to work out structures and relations of meaning not immediately apparent in a text. This requires a certain distance from what is said, which is achieved by a methodological or theoretical stance, recontextualizing what is said in a specific conceptual context" (Kvale 1996: 201).

The context for this interpretation is provided by the main analytical concepts of this thesis: storylines, processes of coordinative and communicative discourse, institutional rules and norms and the structuration and implementation of the discourse. To structure the rich empirical data of the policy documents, secondary sources and interview transcripts in line with these key concepts, a manual coding technique was used.

3.5 Operationalisation of the main concepts of the analytical framework

The analysis was carried out in four steps, which will be described below. The section will also explain how the main concepts have been conceptualised to guide the empirical analysis in chapters 4 and 5. Firstly, the ideas of the storylines have been analysed. Secondly, the interactive dimension of discourse creation and communication has been scrutinised. Thirdly, the analysis of the discourse has been complemented by attention to the institutional context of these processes. Lastly, changes in practices have been examined to test for the practical influence of discourses.

3.5.1 Storylines

Hajer defined a storyline as a "generative sort of narrative that allows actors to draw upon various discursive categories to give meaning to specific physical or social phenomena" (Hajer 1995: 56). Storylines are therefore operationalised as key metaphors, analogies, historical references, clichés, and appeals to collective fears or feelings of guilt which are used to justify the two policy initiatives studied. Storylines are reconstructed by identifying statements that contain elements of the different narratives used in policy discussions (e.g. in relation to the problem framing of innovation for sustainable electricity, used metaphors, new vocabulary, suggested solutions, reference to possible instruments, etc). The analysis focussed on the structuring ideas, themes, narratives and metaphors which recurred frequently in the analysis of the interview and documentary evidence. It focussed in particular on the way storylines framed:

- the ways in which innovation processes are understood (e.g. as the 'chain of innovation' with a 'valley of death'; or as 'system innovations');
- what needs to be done to foster innovation towards sustainability;
- whose responsibility this is (and who is 'to blame');
- the 'division of labour' between public and private actors,
- as well as the way in which technology is understood to contribute to solving the problems in the electricity system and what role other factors play.

The analysis included competing understandings and framings of the problems of how to promote a more sustainable electricity system through policy. If there was disagreement between them, this has been explored in an attempt to elicit the reasons for such differences. In this, the storylines concept is taken to encompass cognitive and normative ideas, concepts and categorisations about fostering innovation for sustainable electricity systems (see Table 1).

Table 1: The operationalisation of storylines

Storylines consisting of	**Cognitive ideas (logic of necessity)**	**Normative ideas (logic of appropriateness)**
ideas, concepts, categorisations, metaphors, analogies, historical references, clichés, appeals to collective guilt or fear	define problem to be solved, propose adequate policy solution, often through reference to techniques and principles of scientific disciplines	'good' normative arguments demonstrate appropriateness of ideas by appealing to existing or emerging values, norms and principles of public life

Source: own illustration, based on (Schmidt 2006a; 2007) and (Hajer 1995)

As the interest of this thesis is to explain the emergence of the two policy initiatives, the analysis concentrated on those selected storylines that were used to promote the new initiatives as well as challenges against them. It investigates why and how they were successful in initiating policy change. The interview transcripts, policy documents and secondary literature were used as sources of data to identify storylines.

3.5.2 Interactive process of policy construction and communication

Both Schmidt and Hajer agree that it is not only the ideas and narratives which matter in analysing discourses. They both pay explicit attention to how discourses and storylines are created (interactive dimension of discourse) and in particular which actors play a role in these discursive processes (e.g. discourse coalitions mobilised around shared storylines) (Hajer 1995: 20). It is important to emphasise that the analysis included governmental as well as non-governmental actors including experts, organised interests, civil servants, elected officials, politicians, 'policy entrepreneurs', government spokespersons, citizens and activists (Schmidt 2006a: 254).

The relevant discourse coalitions have been reconstructed by identifying actors involved in the discussions about innovation policy for sustainable electricity who share the usage of a storyline over a particular period of time and by tracing the formation of coalitions through cross-references between actors and the extent to which actors share practices. Practices will involve activities to support innovations (such as R&D activities, demonstration projects, energy efficiency measures, regulations, conducting research programmes, new forms of partnerships, lobbying activities, etc). The analysis has necessarily been limited to some of the main actors. Main actors are those who most frequently participate in the policy discourse and are highlighted by other actors as being important. The analysis also covered actors who criticise or disagree with the new storylines promoted. The motivations and interests of actors are included as far as possible.

Besides the focus on actors, the analysis also focussed on key events in the policy process of these new policy initiatives which have been highlighted by involved actors as important milestones, and what role they played (e.g. publication of key reports).

The following sources of data have been used to shed light on the processes of policy construction and communication: interview transcripts, policy documents, parliamentary records, policy reports, public statements, and policy announcements as well as interest group statements.

3.5.3 The institutional context

The institutional context is considered to include formal as well as informal norms which vary across countries. Formal institutions considered in the analysis include the governance structures (e.g. unitary or federal political system), the electoral system (majority or first-past-the-post), the division of departmental responsibilities, the rules governing the civil service, etc. (Schmidt and Radaelli 2004). Informal rules considered in the analysis include 'standard operating procedures' (John 2003; Peters 2005) of organisations, political rules of conduct (whether consensual, competitive, or conflictual), administrative practices, etc. This is a wide-ranging list of potential institutional factors relevant for the analysis. For the purpose of this thesis the analysis of the formal institutions relied mainly on existing characterisations available in the literature. In terms of the analysis of informal institutions, any norms or rules guiding acceptable behaviour and practices mentioned by interviewees or policy documents as important in the specific policy context have been included in the analysis. International institutions such as EU rules were included in the analysis when they were considered relevant by interviewees or mentioned as important by secondary sources.

3.5.4 Change in policy practices and institutions

To assess the importance of a discourse it is necessary to look at two criteria according to Hajer: is the discourse being used by many people to conceptualise the world (discourse

structuration), and has the discourse solidified into institutions and organisational practices (discourse institutionalisation)? Hajer argues that if both criteria are fulfilled a particular discourse has become dominant (Hajer 1995: 60-61).

If actors, institutions or organisations speak the language of a particular storyline and thus conceptualise their world in the frames of this discourse, discourse structuration has been achieved. As for the structuration criterion, the analysis of the two case studies thus looked at actors and organisations involved in the policy process under consideration and assessed, through their utterances, whether or not they drew on the particular ideas, concepts and categories of the emerging storyline. This analysis will be presented as part of the sections on the interactive processes of policy construction and communication.

Hajer's second criterion is about the institutionalisation of discourses. How can the question of whether a discourse has become solidified in institutional and organisational practices be assessed? Tracing discourses in policy documents and reconstructing storylines is here combined with the analysis of its effects in terms of changing policies and institutions, as proposed by Hajer:

> "We will speak of discourse institutionalization if a given discourse is translated into institutional arrangements, i.e. if the theoretical concepts of ecological modernization are translated into concrete policies (i.e. shifting investment in mobility from road to rail) and institutional arrangements (introduction of multi-value auditing, or the restructuring of old departmental divisions)" (Hajer 1995: 61)[emphasis added by FK].

The emphasis of the analysis is thus on whether the new storylines have led to new policies being implemented or changes in institutional arrangements. Institutional arrangements include the setting up of new organisations (such as new departments) or changes in the 'standard operating procedures' of existing institutions. Sharp and Richardson, for example, explain that an immigration policy document does not have an impact on outcomes "until it starts to change the practices of the immigration officers" (2001: 199-200). Here then, practices are thought of in a very concrete sense, in the everyday actions of bureaucrats. If

the changes in policies and institutional practices[9] are discursively justified by policy actors by referring to the ideas, concepts and categories of an emerging storyline it can be said that the discourse has been institutionalised. This can be established by process tracing of policy and institutional change in a given policy field, relying on information from interviews and secondary sources as well as policy documents. As the main interest of this thesis are the effects of particular discourses on the two policy initiatives, the analysis will focus on the effects of the discourses on governmental policies and institutions in the sense described by Hajer and Schmidt.

3.5.5 Summary of the operationalisation of key concepts

Table 2 below summarises the key concepts of the analytical framework, their dimensions and the sources of information that have been used in the analysis.

Table 2: The operationalisation of the key concepts of the analytical framework

Concept	Definition	Important dimensions/indicators	Sources of information
Storyline	"Generative sort of narrative that allows actors to draw upon various discursive categories to give meaning to specific physical or social phenomena" (Hajer 1995: 56)	Central metaphors, claims, cognitive and normative ideas, analogies, historical references, clichés, appeals to collective guilt or fear; controversies about any of these elements	- Policy documents - Interview transcripts - Hansard database of parliamentary records
Coordinative discourse	Discourse among policy actors in the process of constructing policies (Schmidt 2006a)	Informal, private negotiations between civil servants, experts, interest groups, elected officials	- Interview transcripts
Communicative discourse	Discourse between policy elites and the 'informed public' in the process of political communication, informing and deliberating policies (Schmidt 2006a)	Public announcements by government Public discussion of policy ideas	- Policy documents - Hansard database of parliamentary records - Interview transcripts - Reports by Advisory Councils

[9] For convenience the term 'political change' will be used in this thesis to mean policy as well as institutional change.

Discourse coalitions	Coalition of actors involved in the production and use of a storyline (Hajer 1995: 65)	Actors involved in debate over a longer period of time and are often referred to by others	- Interview transcripts - Policy documents
Institutional context	Formal and informal rules influencing policy-making processes (Schmidt and Radaelli 2004)	Governance structure Electoral rules Departmental division of labour Organisational 'standard operating procedures' International rules (e.g. EU)	- Secondary literature - Interview transcripts
Effects of discourse	Is the discourse being used by many people to conceptualise the world? (discourse structuration)	Use of ideas, concepts and categories of the emerging discourse by actors and organisations involved in energy policy-making	- Interview transcripts - Policy documents - Secondary sources
	Has the discourse solidified into policy, institutions and organisational practices? (discourse institu-tionalisation) (Hajer 1995: 60-61)	Effects on formal and informal institutions (e.g. legislation; organisational practices within government) Effects on government policies	

3.6 Limitations of the methodology

As already mentioned, case study investigations can attract criticism regarding their potential for generalisability (Yin 1994). The value of the case study methodology lies in its analytic generalisability rather then statistical generalisability. Yin argues for the value of this mode of generalisation, "in which a previously developed theory is used as a template with which to compare the empirical results of the case study. If two or more cases are shown to support the same theory, replication may be claimed" (Yin 1994: 32-33). Case studies can thus contribute to theory development or theory testing and in this way make a contribution to knowledge (Stake 1994: 238; also see George and Bennett 2005).

Another criticism of case studies is that they are in danger of being purely descriptive. Critics would argue that although the individual case is interesting to understand, the wider relevance of the analysis is unclear. The two case studies used in this thesis are descriptive in terms of exemplifying distinct storylines and their political impact but are also

explanatory in illuminating the mechanisms through which certain storylines become dominant and why changes in institutions and policies do (or do not) occur as a result of discursive struggles. Analysis which is based on a clear methodology like process tracing and has theoretical ambitions in identifying mechanisms cannot be considered descriptive.

Another potential criticism is the internal validity of the study. This concern refers to the causal mechanisms to be explained in the thesis. The key problem here is whether the analysed discursive mechanisms are really responsible for the changes in policies and institutions rather than other possible causes. Campbell, for example, points to the difficulty in analysing the interplay of interests and ideas (Campbell 1998). Schmidt also acknowledges these difficulties and argues:

> "Discourse is a complicated variable, however, because the ideas it articulates cannot easily be separated from the interests that find expression through it, from the institutional interactions that shape its expression, or from the cultural norms that frame it" (Schmidt 2003: 129).

This problem is not easily overcome. However, several analysts have argued for the value of process tracing as a suitable method for trying to separate out the different factors contributing to policy change (Campbell 2002: 32). It is important to be open and reflexive about the interpretation of the data and to pay attention to possible rival explanations and counterfactuals during the analysis. The analysis thus tries explicitly to rule out competing explanations as much as possible so that the reader can judge the credibility of the interpretation.

Finally, the methodology chosen has disadvantages when it comes to policy prescription. Discourse analysis does not lead to identification of the 'right thing to do' for policy makers to support a transition towards a more sustainable electricity system. Nor does a discourse analytic approach allow evaluation of the two case studies in terms of which approach is (going to be) more successful[10]. Its aim is more modest: by identifying discursive processes it sheds light on the specific situational logic on which policy framing

[10] Admittedly, it is a limitation of the approach (and many others in policy research) that studying policy processes does not allow policy outcomes to be judged more directly, as those outcomes are difficult to trace over time and the effects of policies can often not be isolated from other influences (Sharp and Richardson 2001).

and practices are based and can thus contribute to more reflexivity about the role and importance of discourses. It might inspire policy makers to "think critically about their own practice" (Sharp and Richardson 2001: 207). As Hajer and Versteeg point out, the strength of discourse analysis "is not to be found in its prescriptive force, but in the ability to trace the discursive power struggles underlying environmental politics" (2005: 181). This is in line with the aim of this thesis as the goal is not so much to come up with prescriptions *for* policy but rather an analysis *of* policy making (Hill 1997).

Having discussed the methodology of this thesis, the following two chapters will present the empirical results of the two case studies in terms of within-case analysis (George and Bennett 2005; Bennett and Elman 2006). The sixth chapter will summarise the findings across the two cases.

4 Case Study I: The Energy Transition in the Netherlands

The following analysis sheds light on how and why the 'Energy Transition' was set up as a new policy initiative to transform the energy system and how this initiative was implemented.

4.1 The Energy Transition

In 2001 in its Fourth National Environmental Policy Plan (NEPP 4) the Dutch government acknowledged the existence of a variety of persistent, intractable and long-term environmental problems such as climate change. It argued that systemic change in societal systems such as energy is necessary to achieve sustainability (VROM 2001). It subsequently set up a policy initiative, the Energy Transition (ET), led by the Ministry of Economic Affairs to manage the transition towards a more sustainable energy system (Kemp and Loorbach 2005; Kern and Smith 2008).

The Energy Transition is based mainly on the activities of transition platforms (Aubert 2007). In six platforms individuals from the private and the public sector come together to develop common ambitions for particular areas (the so-called transition themes), develop pathways and conduct transition experiments (Oudshoff and Klinckenberg 2003; VROM 2003; EZ 2004a).

After developing strategic visions for the selected themes for 2030, the task of the platforms was to work out possible transition pathways along which an energy transition could be achieved. A transition path is understood as a "consistent set of actions, fulfilled preconditions and learning experiences that lead to fulfilment of the ambition formulated" (EZ 2004a: 19). The pathways are explored further by transition experiments carried out by coalitions of stakeholders. The experiments propose ways to travel along the suggested transition paths. The aim of transition experiments "is to see how a new energy system

behaves in a specific practical situation and how the surrounding area reacts to this new system" (EZ 2004a: 19). The first transition experiments started in 2005.

This case study examines why and how this new policy initiative came about and how it was implemented, by analysing the discursive struggles underlying this policy process and its institutional context.

4.2 The dominant discourse around liberalisation and markets as well as environmental concerns in Dutch energy policy

To provide the context in which the 'transitions' storyline emerged, this section will outline the specific Dutch features of the liberalisation discourse dominant in energy policy at the time. Analysis will mainly cover Dutch energy policy in the 1990s and will in particular look at how environmental concerns such as climate change have been considered.

The liberalisation agenda gained currency in the Netherlands during the Lubbers-III government (1990-1994). It has been argued that the traditional neoclassical economics discourse became particularly dominant in the Ministry of Economic Affairs (EZ) and thus "[e]conomically relevant factors are only recognised as far as they are reflected in prices in the market" (van der Straaten 1992: 68). According to this economic theory, environmental problems can be seen as negative externalities of production. Consumption decisions therefore need to be corrected by increasing prices of the problematic activities to achieve an optimal allocation of the factors of production.

With what is called a 'natural monopoly' on infrastructure, its importance for the economy and energy security concerns, the electricity sector was, however, widely thought to present a special case. The Energy Department within EZ was thus still rather sceptical and reluctant to apply this kind of thinking in an unqualified way within the energy sector. Lobbying from the electricity generating sector also opposed the liberalisation discourse and argued that "electricity is not like sugar" (de Jong 2006: 3). The Government supported

this position against the European Commission and was concerned in particular about retaining the monopoly in gas. In discussions with the EU commissioner Cardoso, EZ minister Andriessen stated: "I am and will continue to be a monopolist" (de Jong 2006: 3).

However, in the wider political discourse at the time, it was increasingly questioned why gas and electricity should be excluded from the general trend and treated differently to other commodities:

> "The Dutch utility sector and MEZ[11] energy department could no longer escape participation in these discussions, and from 1991-92 onwards, energy market liberalisation and the resulting industry restructuring became part of the energy policy" (de Jong 2006: 1).

The new minister Hans Wijers was a keen advocate of liberalisation and relying on market forces wherever possible. The Third Energy White Paper published in 1996 built on the idea of "markets wherever possible, government wherever needed" (de Jong 2006: 5). The key objective of Dutch energy policy was set out in the White Paper as "achieving a sustainable energy economy within competitive energy markets" (IEA 2000: 17). The energy sector was to become a 'normal' sector and the Government's choice for 'more market' was widely supported, although there were questions about the detail and the speed of the changes. According to the IEA, the White Paper entailed:

> "a fundamental re-orientation of the Government's role in the energy market in order to increase market consideration in decision making; a shift of policy instruments from the supply to the demand side of the market…and progressive liberalisation of electricity production, import/export and supply" (IEA 1996: 11).

Alongside liberalisation, however, the White Paper also put an emphasis on the challenge of moving to a more sustainable energy economy and paid attention to energy efficiency and renewables as a second main track of policy. Among other elements, the White Paper adopted a policy goal of 10% renewable energy out of the total energy supply in the Netherlands by 2020 (Junginger, Agterbosch et al. 2004). Despite the attention given to markets, the Government retained the position that because of the existence of market failures with regard to adverse environmental effects of energy supply and demand, the

[11] MEZ is the Dutch abbreviation for the Ministry of Economic Affairs.

Government would continue to promote energy conservation and the market introduction of renewables. The Dutch discourse around liberalisation and free markets admitted that there was a role for the Government to play in safeguarding the public interest also in the long term; especially with regard to security of supply, prevention of monopolies, network stability, and in internalising other external costs. The role of the government in a liberalised energy sector was seen as changing from being an active player in the energy market to "safeguarding the public interests in the energy supply by drawing up and enforcing the rules for the market" (EZ 2002: 27). However, this was not interpreted as 'less government' but as government playing a strategic, different role.

To stimulate green electricity consumption, in line with neoclassical economic ideas, a 'regulatory energy tax' (the so-called eco-tax) for small and medium-scale users was set up in 1996 from which green electricity was exempted (van Rooijen and van Wees 2006). This support was justified in terms of avoided GHG emissions as negative externalities of conventional electricity generation. Any instrument requiring a minimum compulsory share of renewable electricity was seen as unfeasible under free-market conditions. Liberalisation was declared to require a focus on demand-side instruments (such as the eco-tax) instead of supply-side measures (compulsory targets). It is thus claimed that the Dutch Government has made "extreme efforts to reconcile economic efficiency and environmental concerns" and that in hindsight "environmental protection has for a long time carried more weight in government energy policy than economic efficiency" (IEA 2000: 26; 27).

In the Netherlands the liberalisation process started with the new Electricity Act entering into force in 1998. In the first step, only large customers were allowed to choose their supplier (Verbong and Geels 2007). This had major impacts on the energy sector:

> "Just like in most member states of the EU, the regional monopolistic electricity sector in the Netherlands had to make way for the coming liberalised free market. Energy distributors began to make the transition to private companies without regional constraints" (Agterbosch, Vermeulen et al. 2004: 2056).

The electricity market liberalisation was completed in July 2004 with every customer being able to choose their supplier (IEA 2004a: 114). Dutch energy policy makers were firmly committed to the liberalisation agenda promoted by the UK as well as the European Union.

The Dutch government decided not only to conform to the stipulations of the EU Directive 96/92/EC but to go beyond them by aiming to introduce full competition in electricity by 2004, instead of the required 33% by 2003 (IEA 2000: 89).

As in other countries, the commitment to liberalised energy markets also had an impact on other elements of energy policy such as energy conservation and renewables policy. Market-based instruments were generally preferred over other instruments to support these policy goals (de Jong 2006: 1). Under the dominant liberalisation discourse, a key element of the renewable energy strategy was a consumer-driven approach, which included fully liberalising the small customers market for green electricity ahead of fossil fuel-based electricity, voluntary agreements, greening the fiscal system and R&D support (Junginger, Agterbosch et al. 2004). New policy initiatives had to go with the grain, as a civil servant pointed out: “in EZ the big thing in energy is market liberalisation so we [the team of civil servants responsible for the energy transition] have to connect with that. If we don’t do that we will always remain a sideshow” (interview 12). This quote already illustrates the dominance of the liberalisation discourse during the time when the Energy Transition initiative was set up and implemented.

In summary, liberalisation and market-based instruments were influential elements of the dominant discourse in Dutch energy policy since the 1990s. The dominant liberalisation discourse and its emerging energy market institutions is thus an important contextual factor which influences energy policy making and constrains the emergence of new storylines to promote policy and institutional change.

4.3 The ‘transitions’ storyline

This section analyses ideas that emerged during a routine policy strategy development process for the Fourth National Environmental Policy Plan (NEPP 4) and formed a new ‘transitions’ storyline (Smith and Kern 2009). In the following, the central cognitive and normative ideas of the emerging storyline are analysed.

Against the background of the dominant liberalisation discourse described above, the ‘transitions’ storyline promoted the need for structural change (‘system innovation’) in socio-technical systems like the energy sector, in order to tackle persistent environmental problems such as climate change. It argues for a long-term transition management approach alongside traditional short-term policies. An active steering towards desirable visions of sustainable societal systems, and the development of experiments to explore possible transition pathways, as well as stakeholder engagement, are central elements of this storyline (Loorbach 2007).

4.3.1 The necessity of ‘transitions’

One main element of the ‘transitions’ storyline was the claim that ‘system innovations’ towards sustainability are necessary in order to tackle persistent environmental problems (VROM 2001: 24). The Fourth Dutch National Environmental Policy Plan aims at fundamental changes in functional systems like energy, transport and agriculture. The policy framework of NEPP 4 is based on the idea that persistent environmental problems are inherent to current social systems (VROM 2001: 11). While the Policy Plan states that the internalisation of external costs of environmental degradation is important to achieve a decoupling of economic growth from environmental impacts (VROM 2001: 8), thereby following a neoclassical economics discourse, it also argued that existing policies are not sufficient to achieve the outlined aims because they “do not adequately take into account the obstacles to sustainable development, which can be regarded as system faults in the economy and institutions now functioning” (VROM 2001: 26).

While past NEPPs focused on upgrading functional systems through the diffusion of technology, NEPP 4 takes a broader approach in which “the systems themselves are seen in need of change” (Kemp and Loorbach 2005: 126). This breaks with the current approaches to environmental policy and the discourse around free markets and calls for ‘system innovations’ which are not to be achieved by continuing or intensifying existing policies. Instead the plan argues, “solving the major environmental problems requires system

innovation; … long drawn-out transformation processes comprising technological, economic, socio-cultural and institutional changes" (VROM 2001: 30).

4.3.2 The possibility of deliberate 'transition management' and its central elements

The second central aspect of the 'transitions' storyline was that 'system innovations' can be influenced by policy makers in terms of their direction and speed (Rotmans, Kemp et al. 2001a). The optimistic message in high-level policy documents was: "Transitions require vision, courage and perseverance from everyone involved. The question is not whether it is possible, but how it is possible" (VROM 2001: 78).

NEPP 4 relied heavily on concepts developed by Dutch researchers in the ICIS-MERIT report (Rotmans, Kemp et al. 2001a) which was commissioned for the preparation of the plan by VROM. In this report a steering approach to direct such processes towards sustainability (transition management) is described (also see Kemp and Rotmans 2004; Kemp and Loorbach 2005; Kemp and Rotmans 2005; Loorbach and Rotmans 2006). This way of thinking is influenced by evolutionary economics, sociology as well as complexity and systems theory. Transition management (TM) employs an integrative and multi-scale framework for policy deliberation, choice of instruments, and actions by individuals, private and public organisations, helping society to escape lock-in while avoiding new evolutionary traps (Kemp and Loorbach 2005: 123-124). Notions of innovation and learning are central to the transitions storyline (Kemp and Loorbach 2005; Smith and Kern 2009). In order to promote innovation and 'out of the box thinking' the idea underlying the approach was to focus policy attention on frontrunners and innovators (interview 18).

Visions are an important element of the 'transitions' storyline. Such long-term visions are seen as an important starting point for broad societal discussions about the desired direction of a transition (interviews 1; 7; 13; 17; 18). In the 'transitions' storyline positive visions of the future play an important role in outlining long-term goals and in developing pathways along which those goals can be achieved (Kern and Smith 2008). The purpose of

employing visions is manifold: to mobilise actors and create support, to create and maintain momentum, to provide a coherent framework for the selection of the experiments and to reduce uncertainty (interviews 3; 17).

To learn about the potential of certain visions and explore possible transition pathways, the 'transitions' storyline puts an emphasis on concrete social experiments with promising technologies which need protection (partial, temporary and gradually phased out) in areas where there is lock-in. The utilisation of new technologies in a protected niche setting is believed to create a transition path in a bottom-up way (Kemp and Rotmans 2004). According to this way of thinking,

> "transition pathways towards these visions can be promoted through experimentation with alternative socio-technical practices in sustainability niches (e.g. organic food, eco-housing, solar heating). The associated social learning informs the design of successive niches, re-evaluates guiding visions and transition pathways, and informs deeper institutional change. … Competing niches, offering fresh approaches, can benefit, grow, and attract wider support… Over a timeframe of 20 or more years, developments through niches follow an 'S'-curve trajectory of growth, diffusion and stabilisation around new, sustainable systems of provision" (Smith and Kern 2009: 80).

The idea of experiments is closely linked to ideas about strategic niche management which have been promoted in the academic innovation literature for some time (Schot, Hoogma et al. 1994).

Another of the key ideas behind the 'transitions' storyline is that it is necessary to target not only industry stakeholders to achieve 'system innovations' but that citizens as well as local and national government will have to play crucial roles in the transition process (VROM 2001: 28). The government itself is not believed to be able to steer the transition process due to a lack of "a good enough overview of the technical and economic possibilities" (VROM-Raad 1998: 10). Therefore societal actors must be given a stake in the transition process. Stakeholders play an important role in the overall process:

> "The government is no longer the only one in the driver's seat when it comes to determining long-term social goals… stakeholders play their part in setting the policy lines, in the creation of opportunities… The advantage of this way of working is that it allows a broadly based *sense of opportunity* to develop" (EZ 2004a: 9).

The engagement of stakeholders is also seen as crucial to create and maintain public support for the long-term transition process (Kemp and Rotmans 2004). The process should focus on visionary frontrunners and entrepreneurs with new ideas. The challenge is seen as engaging stakeholders "to make them interested in solving the persistent problems by shifting from a 'sense of urgency' to a 'sense of opportunities' approach" (interview 1).

In summary, the storyline skilfully combined appeals to existing normative commitments (innovation, stakeholder engagement, planning, environmental awareness) as well as cognitive commitments around the interplay of sustainable technologies with social factors. With its focus on long-term, systemic change it constituted a partial break with the focus of prior national environmental policy plans on negotiated, incremental improvements, for example through energy-efficiency covenants, and outlined a strategic process architecture for how such systemic change could be stimulated.

4.4 The interactive process of policy construction and communication

However, in the analysis of discourses it is not only the ideas that matter but also the underlying processes through which policy ideas are formulated and communicated with the public in order to gain acceptance. This section analyses these processes of policy construction and communication. As specified in the framework, it distinguishes analytically between a coordinative and communicative dimension of discursive processes.

4.4.1 Coordinative discourse

In the coordinative discourse the main interlocutors are policy actors and it is focussed on constructing a policy programme (Schmidt 2006a: 254). The main actors involved in the coordinative discourse around the 'transitions' storyline were:

- a small number of researchers and consultants;

- civil servants from the Ministry for Economic Affairs (EZ) and the Ministry of Housing, Spatial Planning and the Environment (VROM);
- the ministers Pronk (VROM) and Jorritsma (EZ).

4.4.1.1 The discursive politics around the 'transitions' idea

Central to the emergence of the idea that 'transitions' were necessary to solve persistent environmental problems was a coalition of civil servants and researchers as well as consultants who cooperated in various research programmes focussing on sustainable technologies in the 1990s. Some of the individuals involved in these programmes started thinking about technology and sustainability issues along similar lines and formed networks within which these ideas spread. This context provided a crucial background for helping the ideas about 'transitions' to form and subsequently to become accepted into government policy (which will be dealt with in the next section in more detail).

One of the programmes through which the 'transitions' discourse coalition emerged was the Sustainable Technology Development (STD) programme. This research programme for sustainable technologies, involving five Dutch ministries, was financed with € 11 million and ran from 1993 to 1997 (Kemp and Loorbach 2005: 127). Its focus was on identifying technologies which could deliver factor 20 improvements in terms of environmental impacts within 50 years (see Vergragt 2005). According to VROM, STD "has shown how sustainable technology can be developed to meet certain societal needs, based on scenarios for the future" (VROM 1998: 246). Another achievement of STD was the "creation of several new and now self-standing innovation networks with shared goals and agreed action plans for sustainable technology development" (Weaver, Jansen et al. 2000: 283). An important lesson learned from the programme was that long-term thinking is one of the most essential conditions for implementing sustainable development. It also became clear that non-technological factors are important preconditions for sustainability: "Often technologies are more or less available but the barriers are institutional, economical, and especially cultural" (Vergragt 2005: 305). According to this thinking, although technology is seen as pivotal, "there is a need for a goal-oriented, strategic, co-evolutionary, systems

perspective, which stresses the dynamic interrelation between cultural, structural and technological innovation" (Weaver, Jansen et al. 2000: 286). Vergragt points to the fact that the STD programme "was the first to call for deep 'leapfrog' technological, cultural and structural changes in society in order to address sustainability issues on a global scale" (Vergragt 2005: 302). The STD programme was one of the niches in which the 'transitions' discourse coalition had its roots (interviews 2; 7; 9).

In parallel with STD, a technology foresight study commissioned by VROM and carried out by TNO (Netherlands Organisation for Applied Scientific Research) worked along similar lines. The programme was "explicitly meant to re-align technological development with the long-term goal of achieving sustainable development" (Vollenbroek, Weterings et al. 1999: 83). The study explicitly focussed on a timeframe of 15 to 25 years to include more radical innovations. Interestingly, the study did not look at single technologies but took a systems approach [12] to technological development because looking at single components would mean overlooking the relation between the elements which fulfil their societal function, such as transportation or communication, only in combination. Researchers involved in the Technology Foresight Study '81 Options' suggested in 1997 that "in the long run a greater leap in efficiency may be expected from the development of new systems than from optimising existing ones" (Vollenbroek, Weterings et al. 1999: 86). One of the key ideas about transitions as 'system innovations' was thus already present in this report, although in an undeveloped form.

Another programme important for the development of the transitions ideas was the National Initiative Sustainable Development (NIDO) which ran from 1999 to 2004 (NIDO 2001a). The overall goal of NIDO was to structurally anchor sustainable initiatives in society (see Cramer and Loeber 2004). More specifically NIDO's aim was

> "to make a quantum leap forward in sustainable development. By acting as a spur to new development, NIDO can help organisations to fulfil their ambitions with regard to sustainable development. The Dutch government believes that major advances can be made if firms, government bodies,

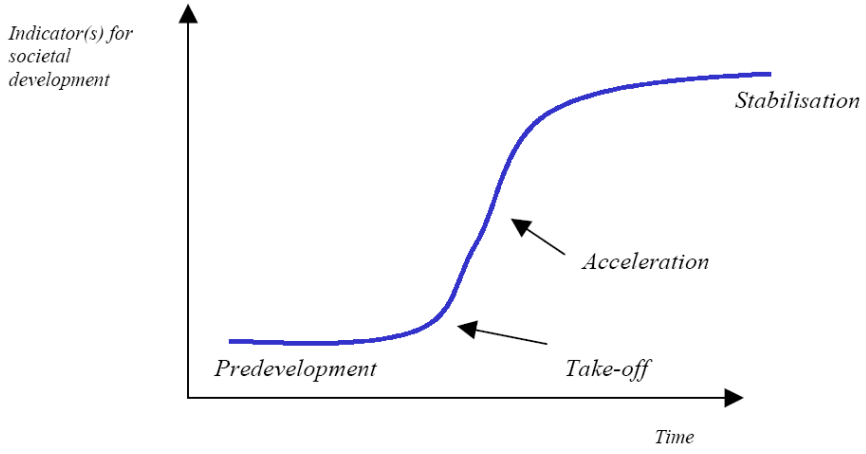
[12] A 'technological system' was defined for that purpose as "the combination of technical means and the human skills and knowledge to make these means perform a specific, societal function" (Vollenbroek, Weterings et al 1999: 84).

> scientists and civil-society organisations are prepared to pool their resources and expertise" (NIDO 2001a: 4).

A member of the board of NIDO recalls: "I first came across the transitions approach when I served on the board of NIDO. It was one of the instruments for NIDO to work with. There was a 'firm belief' by scientists that this was the new approach" (interview 11). Again this programme provided a platform for exploring ideas which started to be shared by a coalition of actors involved in these programmes.

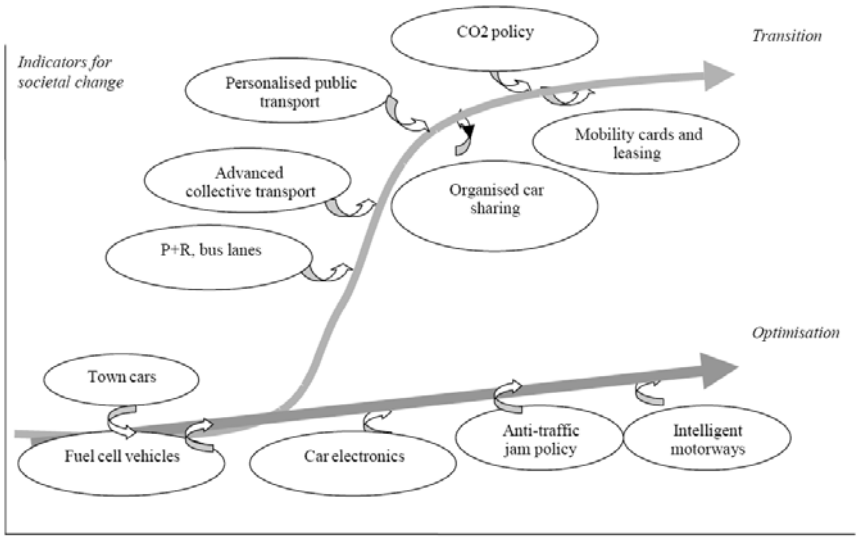
A central metaphor which was used to promote the transitions idea was the S-curve (see Figure 4 and Figure 5). These graphs were used to depict transition processes as consisting of four phases: predevelopment, take-off, acceleration and stabilisation (Figure 4) and to show the enormous societal benefits a system innovation would have compared to a system optimisation strategy (Figure 5). The graph can be interpreted as a transition but can also easily be taken, for example, as a product diffusion curve.

Figure 4: The S-curve metaphor for transitions



Source: (Rotmans, Kemp et al. 2001a: 17)

Figure 5: Transition vs. System Optimisation



Source: (Rotmans, Kemp et al. 2001a: 31)

The S-curve and its interpretive flexibility was crucial in the formation of the transitions discourse coalition as it allowed different actors to agree on the graph without necessarily agreeing on the detail of what a transition would mean in practice.

Through interactions in the various initiatives around technology and sustainability described above, a network of individuals emerged who knew each other personally and who started to think along similar lines and express their ideas in similar terms. One of the main lessons learned from these programmes was that changes in technologies were often impeded by cultural, economic, social and institutional factors and that a systems perspective was necessary (Weaver, Jansen et al. 2000; Vergragt 2005). The emerging discourse coalition spanned researchers, policy makers and consultants as well as a few business people and included around 20 people (interview 7) who were well connected to the relevant ministries. Over an extended period of time in the 1990s the interactions fostered trust between these actors and through dialogue the ideas around the 'transitions' storylines began to converge. A member of this emerging discourse coalition described the process as follows:

> "There was a policy network of individuals and civil servants in favour of those ideas, bridging the science and policy sphere because they were involved in both and could translate ideas and had some credibility and

> also some business relationships. This network emerged out of those programmes" (interview 2).

Similarly, a senior civil servant at the Economic Ministry argued, "the learning processes with [the research programmes] were necessary preliminary steps for a transitions approach" (interview 15). This coalition of actors "consolidated component ideas into the (developing) transitions storyline" (Smith and Kern 2009: 84). The initial coalition had the authority and the communicative skills to affect others and strategically used the opportunity presented by the policy development process of NEPP 4 to get the storyline more widely accepted and to formulate ideas about how to manage transition processes. This process will be analysed in more detail below.

4.4.1.2 The discursive politics around the development and adoption of 'transition management' into national policy

A routine policy strategy development process opened up a possibility to consolidate the 'transitions' storyline and influence policy making. Dissatisfaction with the success of previous National Environmental Policy Plans led civil servants to look outwards for new ideas. The internal thinking within the Environment Ministry about a new policy approach for the further development of environmental policy started as soon as NEPP 3 was published (Keijzers 2000). In the run-up to NEPP 4, several civil servants from the strategy departments of VROM and EZ were working closely together in an interdepartmental working group to prepare the document. This group amongst other things discussed the relationship between innovation and the environment. It became clear that regulation or subsidies would not be sufficient and "people from within the government were looking to the outside for new concepts" (interview 7). In this context the discourse coalition of researchers, consultants and civil servants strategically made use of this window of opportunity and promoted the 'transitions' storyline to provide a new direction for this policy plan. In the context of the discussions about the future of environmental policy two reports were commissioned which were important in developing ideas about how to manage transitions.

While preparing NEPP 4, VROM commissioned a report to the consultancy Twynstra Gudde Management in 1998. The report entitled *Transitions: can three people change the world?*[13] came out in February 2000. The question posed to the group was: 'what influence can governments have in promoting jumpwise change in the field of production, consumption, behavioural patterns, and societal structures' and the report was supposed to identify first insights into drivers and bottlenecks of transitions (interview 23). VROM acknowledged that "technological options are part of this, but also structural changes and cultural changes. They [VROM] were looking for levers for policy making for change processes in a sustainable direction" (interview 23). In their assignment VROM already used the term 'sustainable transitions'. VROM was looking for an 'overarching concept' for NEPP 4 (interview 17). According to Kemp and Loorbach, the report

> "defined the transition concept and argued that societal change in principle could be steered, and that one should look for levers, to be identified through causality analysis looking at causality loops. The report was based on a flux model. It did not openly say that three persons can bring about a transition but indeed offered a suggestion to that effect" (Kemp and Loorbach 2005: 127).

The result was not so much a scientific report as an attempt "to get a first flavour of transitions" (interview 17). VROM started negotiating with EZ about the ideas of this report but EZ wanted 'a more scientific report' and also found a fault in the fact that the report was written by VROM consultants and not economists (interview 23). EZ was thus not yet convinced by the 'transitions' discourse and did not believe in the expertise of the consultants – a common struggle in discursive politics is over the contestations of knowledge claims (Ockwell and Rydin 2006). This led to the commissioning of a second report: the ICIS-MERIT report.

This second report for the preparation of NEPP 4 was commissioned to a group of researchers led by Jan Rotmans, director of ICIS and Rene Kemp, researcher at MERIT, and was entitled *Transitions & Transition Management. The case for a low emission energy supply* (Rotmans, Kemp et al. 2001a). In this report Rotmans et al. described transitions as long-term structural change processes in societal subsystems and outlined a

[13] The original title in Dutch is: 'Transities: kunnen drie mensen de wereld doen omslaan?'

model of how such processes could be influenced in their direction and pace – transition management. The model was exemplified by using energy as an illustration. This report was of crucial importance in getting the ideas of transition management into NEPP 4 (Kemp and Loorbach 2005: 129). They claim that this was due to the close interaction between the NEPP 4 team and the authors of the report. This interpretation is supported by other participants in this process (interviews 3; 4). An observer points out that this "was a very peculiar window of opportunity for both science and policy makers" (interview 19).

Given the context described in the preceding section, ideas about 'system innovations' had been debated between policy makers and researchers for some time. In the write-up of NEPP 4 this debate crystallised and led to the adoption of the ideas of transition management into official governmental policy. This was due to the continuous cooperation between researchers and policy makers. The usual practice of commissioning a report by policy makers and presenting the final report by researchers was not followed. Instead the research group held a workshop with energy experts where the initial ideas were presented for the energy case. After that,

> "A number of meetings have also been held with the Energy workgroup, or its members, as well as with a larger group of people involved with the NMP4. Through these meetings…a collective learning process was created where the ideas of transition management were crystallised through a proportional contribution from the researchers and officials" (Rotmans, Kemp et al. 2001a: 11).

The outcome of the process was not predetermined but arose through the interaction: transition management was thus an idea that gradually emerged from discussions between the research group and the group of policy makers preparing NEPP 4 (Kemp and Loorbach 2005: 129). One participant described this process as a series of meetings "with a lot of confusion, a lot of ideas, a lot of discussion, a highly iterative and interactive process during which the concepts co-evolved" (interview 17). During this process the ICIS-MERIT research team had approximately 30 meetings with policy makers to help them internalise the concept of transitions. Methods used to persuade policy makers included a play, a fairy tale, discussions, and involving a painter in order to represent the main ideas. Consultants also played an important role in this process as they could build bridges

between policy makers and researchers (interview 17). The bottom line of most observers' comments is that Jan Rotmans and other members of the ICIS-MERIT team were very active, entrepreneurial and influential in getting the transition management idea accepted by policy makers (interviews 3; 4; 7; 10; 19; 21; 23). They were "people who had the right words, pointing towards new directions … who also had the authority and the communicative skills to affect others" (interview 7).

This section has argued that the transition management ideas were formulated through a process of in-depth cooperation between a small group of researchers, consultants and civil servants from VROM and EZ. The following section will analyse the process through which the 'transitions' storyline became adopted by the Dutch Government as the basis for their long-term environmental policy.

4.4.1.3 The departmental politics around accepting the 'transitions' approach

Two ministries were central to the acceptance of the 'transitions' idea into the Fourth National Environmental Policy Plan: in the process of preparing national environmental policy plans the Ministry of Housing, Spatial Planning and the Environment (VROM) was the leading ministry given its responsibility for environmental policy, climate policy and the stimulation of 'green' technologies. Equally important was the Ministry of Economic Affairs (EZ) which is responsible for economic, energy and innovation policy.

The discourse coalition promoted this policy formulation process by linking their 'transitions' storyline to other agendas such as business opportunities through green innovation, or the market liberalisation agenda important for the Economics Ministry, and strategic environmental planning and stakeholder involvement for the Environment Ministry. The transitions coalition articulated a suite of concepts which accorded with broader discursive developments and institutional commitments. This led to a broad support base for the transitions initiative across government departments as a result of the non-threatening framing of the transition management approach as additional to existing

policies and the growing dissatisfaction with those existing policies. Interest groups seem to have been largely absent in the policy formulation process.

Ministry of Housing, Spatial Planning and the Environment

At the time when VROM was preparing NEPP 4 "there was a realisation within VROM that the existing environmental policy plans had become a 'dead end', but they had no ideas how to do it" (interview 2; also interview 10). A bureaucrat involved in the process argued that at the time when NEPP 3 was finalised the "discussion on the limits of it had already started: others should do the work, companies should to the work and the government should be in another role" (interview 7). In the same vein Keijzer pointed out that after three NEPPs a new way forward was needed to tackle sustainability issues (Keijzers 2000: 191). An absolute decoupling of economic growth and adverse environmental effects had not been achieved despite the gains in energy efficiency. The Strategy Department within VROM

> "were thinking about a transition much before the NEPP4 was written and he [Vollenbroek, an influential civil servant within VROM] was looking for something to strengthen this view. He was involved and tried to push for this internally" (interview 2; similar point also made in interview 20).

This led to a lot of exchange between academics and policy makers as described in the two previous sections. This exchange was only possible with "the quite open approach of VROM" (interview 20). According to a consultant involved in the process, a civil servant from VROM especially liked the idea of a transition "because of the broader societal scope going beyond a technological innovation concept" and because of the notion that transitions can start through cultural or legislative changes (interview 23).

An observer sums up this process by saying that researchers developed the idea of TM "at a time when VROM wanted to revive environmental policy" (interview 21; confirmed by a VROM civil servant, interview 24). According to him NEPP 4 followed the recognition that persistent environmental problems in the Netherlands cannot be solved by incremental steps or end-of-pipe technologies. There was a belief that 'system changes' were needed.

The internal dynamic of policy learning within VROM and the articulation of a new policy approach by a discourse coalition around civil servants, researchers and consultants coincided.

Ministry of Economic Affairs

For the Ministry of Economic Affairs (EZ), responsible for energy policy, the problem of carbon dioxide emissions was seen as a major market failure in the energy sector which necessitated some kind of government intervention – at a time when government had pulled back since the early 1990s because of liberalisation. The discursive commitment of EZ to the liberalisation agenda was analysed in section 4.2. Smith and Kern have argued that

> "Energy liberalisation was disrupting traditional, corporatist energy policy. Policy-makers were preoccupied with learning how to regulate new energy markets and ensure investment in energy infrastructure. At the same time, political agendas were opening to the implications of climate change" (Smith and Kern 2009: 88).

According to a senior researcher who was part of the discourse coalition, EZ saw the potential of using TM because they were in a difficult situation given that this was the high point of liberalisation, which led to a loss of steering power for EZ. He claims that EZ saw transition management as a new way of steering in-between traditional regulation and the market (interview 17). A civil servant from EZ confirmed this interpretation. She argued that before liberalisation the social functions of energy companies in addressing environmental and social issues were more prominent and companies worked very closely with the Government (interview 1). After liberalisation the energy companies were far more short-term profit oriented, were less willing to invest in pilot projects for new technologies and did not show the same level of commitment to the Government's environmental goals[14]. EZ was looking for a way to increase cooperation with companies to

[14] One example where this changed attitude became visible was the green label trading scheme for green electricity. This system was set up to implement the voluntary targets of the Dutch energy distribution companies which were agreed upon with the Government in the 1990s. The system was only operational for two years and was terminated in 2001. It has been claimed that with the liberalisation in the electricity markets "a new voluntary target with energy companies could not be agreed upon" (Dinica and Arentsen 2003: 610).

address environmental and social issues more prominently and TM offered an appealing way to do this.

Part of the appeal of the 'transitions' storyline for EZ was that transition management was seen as a potentially successful approach "to get stakeholders buying into the idea of low carbon: the challenge now is to make them interested in solving the persistent problems by shifting from a 'sense of urgency' to a 'sense of opportunities' approach" (interview 1). Bruggink talks about the 'magic of transition management':

> "Policy makers are no longer viewed as detached and clinical observers of sociotechnical change, they are considered as active participants able to promote technological innovation in the right direction. They cannot only offer a promising perspective towards sustainability; they can actively make it happen… The idea of energy transitions thus magically transforms the bleak landscape for global sustainability into a promising avenue for action. It marries the sense of urgency with an equal dose of the sense of opportunity" (Bruggink 2005: 10-11).

Besides the usual EZ agenda, which is to stimulate growth, business and innovation, there was also the aim of developing a new partnership with businesses, which made the ideas of TM appealing for EZ as it appeared to be a way to do this (interview 20). Similarly, another senior researcher claims that the idea of transition management was linked with the innovation agenda of EZ and the Lisbon Strategy. The idea of combining economic growth and sustainable development through 'system innovations' which could possibly offer opportunities for Dutch firms was attractive for policy makers within EZ (interview 2). The 'transitions' storyline therefore provided possibilities for EZ to link this agenda to their priorities, thereby creating a win-win situation.

Civil servants in EZ also started to accept the argument of the 'transitions' discourse coalition that standard policies are not able to provide an adequate answer to persistent environmental problems such as CO_2 emissions (EZ 2004a: 9). System improvement was seen as eventually reaching its limit and a new approach outside of existing policy frameworks was needed, as an EZ civil servant explained: "our assumption is that incremental change is useful but will not do the job" (interview 12). He reasoned that unchanged or present-day policies might be enough to meet the Kyoto targets, but to

achieve sustainability 'system innovations' are needed and this requires a different policy approach as system changes are "not only a matter of technology but also a matter of new roles, new rules, new playing fields". Another civil servant within EZ added that to solve the persistent environmental problems such as climate change and biodiversity loss requires a new policy approach and that the capacity to evoke change has been too low in some areas (interview 1). One criticism of existing energy policies was the relatively short time horizon. During the process of preparing NEPP 4 EZ found that

> "we had too little ideas about the far future of the energy system. We always had traditional scenarios of the central planning office going up to 2010, 2020, but we were so far not too concerned with the distant future as opposed to our 'competitors' from VROM who did have a view on what should be done. We should have a story of our own" (interview 12).

However, not everyone within EZ adopted the new discourse. Clearly some civil servants saw the role of the Government as a facilitator, mainly relying on market mechanisms and price incentives. Some civil servants questioned whether governments can facilitate energy transitions and advocated that they should 'let the market do it'. The adoption of the transition storyline's ambitions as official policy thus produced a number of internal conflicts within EZ (interviews 4; 6).

4.4.1.4 Summary of the analysis of the coordinative discourse

The coalition behind the 'transitions' storyline was successful in formulating the transition management policy programme and getting this idea adopted into national policy for a number of reasons: the successful reframing of the problem to achieve sustainability through 'system innovations'; the claim that TM was additional to existing policies, as well as the interpretative flexibility of the storyline which allowed win-win situations with a number of other policy objectives to be created.

Firstly, as argued above, a coalition of researchers, consultants and civil servants reframed the problem of how to achieve sustainability in terms of 'system innovations'. Based on the experience and learning from a number of research programmes, structural change in societal subsystems was considered as the only option for solving persistent environmental

problems. A steering philosophy (transition management) to foster such ‘system innovations’ was developed jointly.

The second crucial factor for the success of the ‘transitions’ storyline was the interpretative flexibility of the concepts. Transition management ideas could be linked to ongoing discourses and demonstrated resonance with problems that different ministries were facing at that time. The crises in the agricultural industry (food scares, BSE), in environmental and energy policy (climate change, biodiversity loss), in transport (legitimacy crisis of engineering, failure of ‘predict and provide’ approach) and in economic and innovation policy prepared the ground for a new approach. In other words, each ministry had different reasons for acknowledging the need to change its approach and the sectors which they oversaw. According to a senior researcher, civil servants picked out notions which fitted with their prior commitments:

> “We are a consensual political system so transition management had to be linked to dominant discourse (less state, new public management, liberalisation). People who picked it up were heavily embedded in that discourse. What especially civil servants, but some of the scientists promoting it, picked out of it, were things that connected to that dominant discourse because that would make it land. There has been much emphasis on the ideas of interactive policy making, stakeholder involvement, government in the second line. All of this is there [in the TM approach] and it is interesting but it is not the definitional feature of ‘system innovations’” (interview 10).

He argues that the unique aspect of TM is not so much this interactive component but rather the thinking in terms of structural change. This more radical interpretation of the TM concept has not been at the core of the described policy discussions. Instead those were more focussed on the participatory elements of TM. A proponent of TM agrees with that point and states that “policy makers only use the ideas which suit them, those which fit into their agenda, not the whole approach” (interview 18).

The convergence around the ‘transitions’ storyline occurred despite the different interests of government departments because its concepts and language were flexible. Proponents of TM admit that at the point in time when the approach was adopted in NEPP 4 the concepts were only roughly developed (interviews 17; 18) and this contributed to the flexibility. The

concept of TM is flexible in several senses: with regard to the goals (structural system innovation alongside 'normal' innovation), the means (emphasis on participatory process versus elaborate process architecture including participation and control policies), the language (innovation, participation, learning) and the role of government (facilitator versus taking the lead while putting the regime under pressure). One observer pinpoints this by saying: "TM was a mobilising concept which was vague enough to be inspiring" (interview 7).

4.4.2 The communicative discourse deliberating and legitimising the 'transitions' storyline

As pointed out above, in democracies policy ideas need to be publicly deliberated and legitimised. This includes communication with the 'informed publics' about policy problems and their suggested solutions. This process usually involves politicians, campaign groups, party members, citizens, experts and the media who discuss the ideas developed in the coordinative discourse with the public. Ideas cannot be seen as a one-way street but are in this process discussed, deliberated and potentially changed (Schmidt 2006a: 254-255). Important actors involved in the communicative discourse in this case were:

- government advisory councils such as the general energy council and the VROM council;
- parliamentarians;
- business stakeholders.

The ideas of the 'transitions' storyline were discussed publicly between the ministries and influential advisory councils a long time before the ideas were adopted as official policy in 2001. The VROM council[15] had already introduced the term 'transition' in 1998 in its advice for the Climate Policy Implementation Document, entitled *Transition to a low-carbon energy economy*. The document does not have a clear conceptualisation of what a transition is but states that "radical changes will be needed in our energy economy (transition process) in order to meet the CO_2 emissions objective for the longer term"

[15] The Dutch Council for Housing, Spatial Planning and the Environment (VROM council) is charged with advising Government and Parliament on the main aspects of policy on the sustainability of the environment and on housing, spatial planning and environmental management.

(VROM-Raad 1998: 7). Their recommendations include that the policy process for a long-term strategy but also for short-term measures needs to be shaped according to these long-term goals. They also point out that more regulation is not the answer and that market-based instruments should be in the fore while emphasising that societal actors (companies, other institutions, consumers) must be given a stake in the transition process. This shows that from early on the advisory council publicly supported key ideas of the 'transitions' storyline.

In the cabinet's reply to the recommendation of the VROM council, minister Pronk agreed that self-governance of target groups in combination with market-based instruments was central to climate policy but he does not use the term 'transition' (Tweede-Kamer 1999: 9). Subsequently, the VROM policy document *The Netherlands' Climate Policy Implementation Plan. Part 1: Measures in the Netherlands* published in 1999, explicitly referred to the advice from the VROM council and agreed that a long-term strategy focussing on technological and policy innovation was necessary to achieve deep cuts in CO_2 emissions. It acknowledged that "fundamental changes in the national energy economy" were required (VROM 1999: 5). This indicates that even before NEPP 4 VROM had started to think about a long-term strategy to tackle climate change, had accepted the transitions idea and was looking for policy innovations to foster a "transition to the desired situation" (VROM 1999: 92).

In a joint report in 2004 two Dutch advisory councils welcomed the transitions approach. The councils acknowledged the progress that the Ministry of Economic Affairs had made while emphasising that "the transition approach should form the guiding principle for energy policy as a whole" (VROM-Raad and AER 2004: 24). The councils also emphasised that the approach should be more international and urged the Government to increase their commitment to the goals of the energy transition. The report used key elements of the 'transitions' storyline and supported the transitions approach publicly.

However, the 'transitions' storyline also encountered some public criticism from parliamentarians and stakeholders. One of the criticisms raised by members of Parliament

was that the ‘transitions’ approach in NEPP 4 was not budgeted in the same way as other NEPPs and that clear goals and instruments were missing from it (criticisms raised by, for example, MP Samsom and MP Duyvendak)[16]. NEPP 3 contained a summary of expected costs of existing environmental policy without new policy and including the NEPP 3 policy package (VROM 1998: 251). NEPP 4 on the contrary only acknowledged that the transition policies outlined in the document “will lead to social costs and costs to be borne by the government. The funding of these policies has not yet been guaranteed” (VROM 2001: 75). Nooteboom finds that “Despite being unspecific and unaccountable, Parliament accepted transition management. It gave NMP4 [Dutch abbreviation for NEPP4; FK] the benefit of the doubt, but requested annual progress reports” (Nooteboom 2007: 88).

The government publicly promoted its transitions approach as a potential third way (between the market and governmental planning) suitable in times of liberalisation (EZ 2004a). As mentioned earlier, a number of business actors were involved in the predecessor programmes such as NIDO (interview 7) and supported the ideas behind it. Business actors were consulted about their willingness to participate in an energy transition process (EZ 2002: 60) and responded positively. A senior researcher observed: “EZ managed to get industry really involved in the process and they are very happy with that” (interview 20). The support from business therefore strengthened the ‘transitions’ storyline.

This storyline, and its policy value, was thus publicly supported by a number of key actors and this contributed to the discourse structuration. Points of public critique included the domestic focus of the transition initiative (VROM-Raad and AER 2004), and its practical value was questioned by some parliamentarians (‘no clear goals, no clear instruments, no clear financial implications’). However, the modularity of the storyline meant that most actors could focus on elements meaningful for their agendas and interests, which thus helped maintain overall support.

[16] See Tweede Kamer, Vergaderjaar 2005–2006, 27 801 en 28 663, nr. 43.

4.5 The institutional context in the Netherlands

As discussed above, institutions can have an important impact on policy processes. The framework combines attention to formal institutions (such as the governance structure, the electoral system) and informal institutions (such as organisational routines and norms) to assess the impact which this context has on discursive developments. It will be argued below that informal institutions such as rules and administrative practices play an important role in explaining the adoption and the shape of the implementation of the 'transitions' storyline.

The Netherlands is a unitary state in which state power is centralised and there is a strongly corporatist polity, "where the state acts as a coequal with certain 'privileged' interests, generally business and labour, in policy formulation and implementation" (Schmidt 2006a: 224). The Dutch political system is heavily based on the consensual polder model with close cooperation between political parties, trade unions, industry and environmental organisations to solve societal problems: "consensual legitimacy is a vital norm in the history of the Dutch political system" (Schenkel 2000: 167). In the energy area the Netherlands is well known for its approach to target-group involvement and its tradition of cooperation between government and energy companies (Weale 1992; Gouldson and Murphy 1998; Breukers and Wolsink 2007a), although liberalisation has had an impact on the governance of the energy system, putting more emphasis on market mechanisms (Agterbosch, Vermeulen et al. 2004). Traditionally, the market players are "used to cooperating on a voluntary basis with the government and among each other" (Arentsen and Künneke 1996: 550). This is particularly reflected in the use of covenants: "Reflecting the "voluntary" agreement philosophy that is so central to Dutch political culture, an increasing number of collective and individual target groups have become participants in covenants" (Schenkel 2000: 176). Under the Dutch polder model the policy preference (for example in encouraging energy efficiency) is thus not regulation, but voluntary covenants (interviews 18; 20).

However, the culture of consultation and consensus building of the polder model, according to a VROM civil servant, encourages consensus at the lowest common denominator as it is targeting non-active companies in terms of innovation. In contrast, transition management tries to support pro-active, leading companies (Vollenbroek 2002). So while the covenant approach was considered quite successful in encouraging energy efficiency (Krarup and Ramesohl 2000; Rietbergen, Farla et al. 2002), the polder model has been criticised for being too corporatist and for removing environmental issues from the political agenda (Martens and Spaargaren 2005) as well as being incapable of dealing with persistent environmental problems (Rotmans and Loorbach 2008).

The heritage of the polder model is of relevance for the analysis presented here as interview evidence suggested that the terminology used in TM, such as ‘arenas’, is very similar to the polder model and that this was one of the reasons why TM was adopted (interview 19). Similarly, another senior researcher argued that in a consensual political system like the Netherlands any new approach has to be linked to dominant discourses of the time, such as ‘less state’, ‘new public management’ and ‘liberalisation’ (interview 10). Also, Nooteboom described a merger of the ideas of TM with the heritage of the polder culture (Nooteboom 2005: 28). So while according to transition management advocates (interviews 17; 18) as well as civil servants (Vollenbroek 2002; also interviews 6; 15) the ‘transitions’ storyline was intended as a break with the polder model, focussing on visionary ideas of frontrunners and making choices instead of consensus-seeking stakeholder participation, the promoted ideas appealed to a wider range of stakeholders because they were re-interpreted in line with existing normative commitments of the polder model (interview 19). Other TM proponents were sceptical from the outset claiming that “any kind of model in a consensual culture will be used in a consensual way” (interview 20).

Another important institutional feature of the Netherlands in this context is the electoral system. Schmidt argues that representative systems in unitary states such as the Netherlands diffuse the power of the executive between a wider range of parties, “tend to promote compromise among state actors and to depend on cooperation with societal actors” (Schmidt 2006a: 227). Because power is dispersed between a number of different parties,

consensus-seeking and coalition governments are normal practice (Lijphart 1999: 67). According to Timmermans and Andeweg, “All postwar Dutch cabinets have been composed of at least two but more often three or more parties” (Timmermans and Andeweg 2003: 500). At the time of NEPP 4 in 2001 the Netherlands had a coalition government consisting of the Social Democratic Party, the Liberal Party and the Social Liberal Democrats. According to van der Straaten (1992), Dutch political culture follows a tradition of tolerance and consultation, as the political ‘enemy of today’ could be tomorrows coalition partner. The necessity of coalition governments thus requires consensus orientation but it has in turn also enabled the Energy Transition initiative to ‘survive’ several changes in government.

A third institutional factor important in shaping the emerging ‘transitions’ storyline and facilitating its adoption as national policy was the open culture of the civil service in the Netherlands (interview 20). The analysed processes of coalition formation and storyline creation were only possible through a substantial amount of informal cooperation between civil servants, consultants and researchers. According to Kemp and Loorbach,

> “The people involved in this group were not bonded by departmental rules; they were acting rather as free individuals. The working group was not used as a platform for interdepartmental negotiations, which probably facilitated its functioning as a think tank within the government” (Kemp and Loorbach 2005: 127).

It seems to be an important detail that, within this network, civil servants from different ministries were allowed to experiment with new ideas and think creatively about future policies. The open culture of the civil service in the Netherlands thus facilitated the emergence of the ‘transitions’ storyline and its adoption into national policy.

As pointed out already, existing institutions can have a constraining as well as enabling impact on storylines and discursive interactions legitimising new policy initiatives. In the case of the ‘transitions’ storyline the open civil service culture enabled the interactions of the discourse coalition to develop the ideas around transitions and transition management jointly with researchers and consultants. Dominant institutional norms around consensus, deliberation and cooperation shaped the development of the ‘transitions’ storyline away

from the initial focus on frontrunners, which had subsequent implications for the institutionalisation of the storyline, as will be dealt with in more detail below (also see Kern and Smith 2008).

4.6 Change in policy practices and institutions?

After having analysed the emergence of the 'transitions' storyline, this section analyses what impacts its emergence had on Dutch energy policy. While section 4.4 analysed the discourse structuration, the following section will analyse the discourse institutionalisation of the 'transitions' storyline by describing the main activities of the Energy Transition project. The subsequent section will investigate to what extent this implementation is in line with the 'transitions' storyline.

4.6.1 Setting up of the Energy Transition[17]

The emergence of the 'transitions' storyline and its endorsement through the Fourth Dutch National Environmental Policy Plan (VROM 2001) led to a new policy initiative. In March 2001 the Ministry of Economic Affairs (EZ) appointed itself as the 'transition manager' of the Energy Transition (EZ 2004a: 15). The Energy Transition is based mainly on the activities of transition platforms (Aubert 2007). Within seven platforms individuals from the private and the public sector come together to develop a common ambition for particular areas (the so-called transition themes), develop pathways and suggest concrete transition experiments (Oudshoff and Klinckenberg 2003; VROM 2003; EZ 2004a).

The initial selection of transition themes was based on stakeholder consultations as well as an intensive scenario study, the Long-Term Energy Supply Strategy (LTVE) project, which was drawn up in 2000. It outlined the Ministry's vision of the future energy supply (clean, affordable, and secure). Its intention was to stimulate discussions about the energy supply in the Netherlands in 2050 and it focussed on devising a portfolio of strategies for

[17] Parts of this analysis have been published as (Kern and Smith 2008).

investment decisions, sustainability and R&D "which result in minimum regrets" (IEA 2003: 44). The project's final report distinguished four scenarios (see Kemp and Loorbach 2005: 137). The project brought up themes that would be important cornerstones for a sustainable energy system in any of the four scenarios. Those four themes (new gas, chain efficiency, sustainable mobility, green resources) also emerged from the stakeholder consultation as ideally suited for a transition approach given the international state-of-the-art of technology development and the specific position of the Netherlands (EZ 2002: 60). Later three more themes (sustainable electricity, energy in the built environment, greenhouses as energy sources) were added so that the Energy Transition now encompasses seven themes [18]. It is stated that these themes "will be worked out in more detail to give direction to energy and innovation policy" (EZ 2004b: 5).

After developing strategic visions for the selected themes for 2030, the task of the platforms is to work out possible transition pathways along which an energy transition can be achieved. A transition path is understood as a "consistent set of actions, fulfilled preconditions and learning experiences that lead to fulfilment of the ambition formulated" (EZ 2004a: 19). As the transition paths serve as criteria of eligibility for obtaining public funding they had to be officially certified by the Ministry of Economic Affairs. By 2006, 15 out of the 26 transition paths suggested by the stakeholders had been accepted (SenterNovem 2006b). This number has since increased to 31[19].

The pathways are explored further by transition experiments carried out by coalitions of stakeholders. The experiments propose ways to travel along the suggested transition paths (EZ 2004a: 5). The declared aim of the transition experiments "is to see how a new energy system behaves in a specific practical situation and how the surrounding area reacts to this new system" (EZ 2004a: 19). The first transition experiments started in 2005 (see Figure 6 for examples).

[18] For more information on the themes, see: http://www.senternovem.nl/energytransition/themes/index.asp.
[19] For a full listing of transition pathways under each theme, see: http://www.senternovem.nl/energytransition/themes/index.asp.

Figure 6: Examples for transition experiments

One of the experiments is a ***micro heat and power project***. In a trial project 50 homes in Groningen have been supplied with home power plants which produce heat and electricity from natural gas boilers. Any surplus electricity can be sold to the electricity company. It is planned to upscale the project to 1000 units by 2007 and 10.000 units in later stages.

Another example is the ***50% project by the Dutch paper industry***. The ambition of the Dutch Paper Industry Association is to save 50% energy use along the production chain of paper by 2020. The association cooperates with actors from the entire production chain – from raw materials and machine suppliers to end users and waste processors – to fulfil this ambition.

A third example for a transition experiment is the ***'residual heat' project in Rotterdam***. This project aims at providing a residential area in the South of Rotterdam with residual heat from industry in the Rotterdam Harbour District (Shell-Pernis).

Source: (EZ 2004a)

The Energy Transition is funded through public subsidies and investments by companies. The National Energy Research Strategy (EOS) has an annual budget of €135 million (EZ 2001: 3). Its scheme to support demonstration projects (EOS-DEMOS) has been closely aligned with the existing transition paths and has contributed funding of more than € 41 million between 2004 and 2007 (see Table 3).

Table 3: Subsidies under EOS-DEMO scheme, 2004-2007

Demonstration projects (EOS-DEMO)					
Platform	Projects approved	Investment amount x 1 million euro	Subsidy amount x 1 million euro	CO_2-reduction in kton/year	Theoretical repetitive potential[40] kton/ year
New Gas	49	125.5	18.3	74	9,234
Sustainable Electricity Supply	9	26.5	4.0	2	855
Transport (Sustainable Mobility)	4	9.3	1.1	4	618
Green Raw Materials	4	6.3	1.5	4	289
Greenhouse As Energy Source	14	61.6	7.6	142	8,485
Chain Efficiency	16	50.1	9.4	46	2,793
Built Environment	-	-	-	-	-
Total	96	279.3	41.9	273	22,274

Source: (SenterNovem 2008: 113)

The Energy Transition also led to an additional subsidy scheme under EOS, the Unique Chances Subsidy Scheme (UKR), which provides funding for transition experiments. It was preceded by a limited subsidy scheme to support feasibility studies which ran between 2003 and June 2004 and had a total budget of €1.5 million (Novem 2003: 5). The UKR initially had a budget of €35 million over several years (EZ 2004a: 29) but provided subsidies of €118 million between 2004 and 2007, which supported private investments of more than €957 million (see Table 4). The UKR was set up because "existing energy and innovation instruments do not yet fit in well with the set-up of transition experiments" (EZ 2004a: 29).

Table 4: Subsidies under UKR scheme, 2004-2007

Unique opportunities scheme (UKR)				
Platform	Projects approved	Investment amount x 1 million euro	Subsidy amount x 1 million euro	CO_2 reduction in kton/year
New Gas	22	316.7	45.7	1,649
Sustainable Electricity Supply	2	9.1	2.0	2
Transport (Sustainable Mobility)	10	150.1	10.8	1,053
Green Raw Materials	5	100.4	12.5	39
Greenhouse As Energy Source	1	111.0	4.0	90
Chain Efficiency	7	260.2	42.1	377
Built Environment	1	10.1	1.2	1
Total	48	957.8	118.3	3,211

Source: (SenterNovem 2008: 112)

Two institutional changes occurred as part of the Energy Transition: firstly, the transition platforms were complemented by an energy transition taskforce (TFE). The TFE consisted of 17 high-level members mainly from industry and the public sector and was chaired by the CEO of Shell Netherlands. This advisory group was charged with the task of overseeing the transition process and identifying strategic directions. The taskforce was "intended to strengthen the role of the platforms and to determine which technological spearheads offer the best prospectus for the Netherlands" (EZ 2005: 30). Since then the taskforce has become a dominant actor in the process, e.g. through publishing a national transition action plan in May 2006 (Taskforce Energy Transition 2006). In interviews with researchers and NGOs the taskforce has been criticised for being dominated by large energy companies from the existing energy regime such as Shell, Essent, Electrabel and Gasunie (interviews

17; 18; 20). In 2008 the taskforce was replaced by an Energy Transition Board, initiated by VROM and EZ for a period of five years, which is hoped to provide a continuation of the taskforce's work[20]. It includes all platform chairs as well as three independent members and is chaired by Theo Walthie, a senior advisor and board representative from the Dow Chemical Company. Its tasks are: creating support for the energy transition; developing, implementing, initiating and evaluating transition paths; advising the Government and providing information; being the voice of the market towards the Government; looking for international cooperation; helping prioritise developments; and monitoring the cohesion of the activities.

Setting up a taskforce along the lines of traditional advisory councils similar to already-existing councils such as VROM council and SER is not particularly innovative and replicates existing institutional set-ups. Thus, in part, the Energy Transition follows polder-model patterns of establishing arenas for dialogue between social partners (government, firms, NGOS, interest organisations, and researchers). The taskforce is therefore "reminiscent of neo-corporatist (Dutch polder model) policy-making" and "in practice transition management replicates the very kind of network structures that transition scholars suggest we avoid" (Hendriks 2008: 1017). This examples shows how institutional commitments influence the implementation of the ideas of the 'transitions' storyline and shape them into familiar ways of doing things.

A second institutional change was the creation of an interdepartmental directorate Energietransitie (IPE). This new directorate is located at the Ministry of Economic Affairs and encompasses 30 civil servants from six ministries[21]. It is hoped that through the directorate "a good fit between ongoing policy dossiers and policy conditions for 'system innovations' over the longer term" will be achieved (EZ 2005: 52). The impulse for the directorate came from stakeholders involved in the Energy Transition who "developed pressure on government to re-organise policies and combine them" (interview 24). This

[20] For details, please see: http://www.senternovem.nl/energytransition/energy_transition_board/index.asp.
[21] The Ministry of Foreign Affairs, the Ministry of Economic Affairs, the Ministry of Finance, the Ministry of Agriculture, the Ministry of the Environment and the Ministry of Transport.

example demonstrates how the adoption of new policy ideas raises stakeholder expectations with regard to policy coherence.

4.6.2 Influence of the ‘transitions’ storyline on practices of the ET

While the Energy Transition has been described above as a new policy initiative which was designed based on the ‘transitions’ storyline, the question is whether its practices have been shaped by core elements of the storyline.

In the energy sector the institutionalisation of the ‘transitions’ storyline took place through the Energy Transition led by the Ministry for Economic Affairs as analysed above. In line with central elements of the storyline, public-private transition platforms to develop a vision for a sustainable energy system; a portfolio of transition pathways; a support scheme to fund transition experiments; and an interdepartmental directorate to coordinate the activities across different Ministries were set up. At first sight the adoption of the ‘transitions’ storyline by policy makers thus led to substantial change in policies and institutions.

However, a number of practices in the ET are not in line with the original storyline and thus cannot be explained by relying on discursive factors. Among these elements are the dominance of incumbent actors in the project, the focus on technologies, and the choice of experiments according to narrow ‘market potential’ considerations and cost benefit analyses, as well as the reliance on traditional policy instruments.

Despite the suggested focus on frontrunners in the ‘transitions’ storyline, policy makers fell back on ‘the usual suspects’ and implemented the ET according to the dominant administrative culture in a consensual way. The process came to be dominated by incumbent energy companies (Kemp, Rotmans et al. 2007; Kern and Smith 2008). Stakeholders recruited from existing policy networks were the starting point for the public-private transition platforms which were established for each theme (interviews 1; 21; 24).

Another mechanism to enrol stakeholders was to create publicity about the project so that interested parties could contact the Ministry (interviews 1; 6; 15). EZ appointed business representatives as chairs for all platforms who then identified other interested stakeholders (interviews 6; 12; 16; 17). An analysis of the composition of the six platforms (see Table 5) shows that businesses are the dominant actor group while civil society organisations are few.

Table 5: Participation in the private-public platforms of the Energy Transition

Platform	Government	Business	NGOs	Intermediaries[22]	Science	Total
Green Resources	1	6	1	1	6	15
New Gas	1	6	1	1	3	12
Chain Efficiency	1	6	0	1	3	11
Sustainable Mobility	3	10	3	0	0	16
Sustainable Electricity	1	3	0	0	3	7
Built Environment	0	4	4	2	1	11

Source: own compilation based on list of participants obtained from the secretaries of the platforms from SenterNovem (as of June 2006); the platform on 'Greenhouses as an energy source' did not exist at that time

The only environmental NGO actively involved in the Energy Transition project is Stichting Natuur en Milieu (Society for Nature and Environment). Larger companies are much more represented than SMEs (interviews 3; 5; 12; 19; list of participants). The Government shows a surprisingly low degree of participation. The involvement of researchers varies greatly across platforms. Critics argue that the platforms are dominated by regime incumbents (interviews 2; 3; 11; 13).

Building on existing networks and appointing business chairs who themselves pick more participants led to a self-organising network derived from the incumbent energy regime. Kerkhof and Wieczorek cautioned that such a self-organising network strategy will lead to

[22] The category *Intermediaries* encompasses representatives from municipalities, SenterNovem (excluding the secretaries), the provinces, regional initiatives (such as Rijnmond) or national advisory boards such as SER.

the dominance of regime incumbents and exclude the viewpoints of less prominent actors, which may provide insufficient room for learning and innovation (van de Kerkhof and Wieczorek 2005: 738).

While the academic TM advocates emphasised the importance of social factors in transitions, Hendriks points out that the depiction of a sustainable energy system by the Ministry of Economic Affairs rests on only two actor groups: government and the market; citizens are not thought to be playing a major part (Hendriks 2008: 2019). This example shows how the Ministry re-interpreted the transitions ideas in line with their departmental agenda, which puts emphasis on creating business opportunities. Therefore citizens are not believed to be crucial stakeholders.

A senior researcher argued that

> "EZ gets a certain amount of innovative space to develop this transition policy and on the other hand they are victims of the same structure and the same culture they have been within for years or decades. Hugo Brouwer[23] is infected by the polder model on the one hand but on the other hand he sees that the Ministry should not necessarily take the lead but very much the private sector" (interview 17).

This example shows that while storylines need to appeal to existing norms and values to become accepted, they are vulnerable in their institutionalisation to being reinterpreted in line with embedded institutional norms (such as the polder model). The dominant corporatist policy-making patterns thus strongly influenced the implementation of the ET and led to a capture by incumbents. Hendriks confirms that neo-corporatist ideas persist in political practice and shape the Energy Transition (2008: 1026).

Despite the importance of non-technological factors in 'system innovations' in the 'transitions' storyline, the implementation of the Energy Transition focussed on technological innovations while social, cultural or institutional factors were downplayed. The focus on technologies was criticised by researchers (interviews 17; 18; 19) (Kemp, Rotmans et al. 2007; Kern and Smith 2008) but also self-critically acknowledged by civil

[23] Hugo Brouwer is the director of the energy transition.

servants involved in the Energy Transition (Dietz, Brouwer et al. 2008). The above-described dominance of business actors in combination with the Ministry of Economic Affairs' aim to create new energy business led to a focus on technological innovation on the supply side rather than social or institutional changes. Even though energy conservation is generally believed to play a major role in sustainable energy systems there is no '80% lifestyle'[24] platform, or experiments in which behavioural change is central. A senior researcher argued that in the Energy Transition project demand-side aspects are only recognised in narrow economic terms, and deeper lifestyle issues are not part of the transition policy discourse (interview 20).

Another example of the persistence of existing norms and familiar administrative routines is the use of tools like cost benefit analysis or criteria like effectiveness to select transition pathways and experiments (Kern and Smith 2008) which can be considered as contradicting ideas that see experiments as high risk, high potential endeavours (Rotmans 2005). In the practice of the ET, market potential remains the dominant selection mechanism even in the early stages of niche development. The selection criteria for themes, platforms and transition experiments are quite narrow in emphasising conventional economic efficiency criteria. The criteria reflect existing strengths, and focus on 'minimum regret options', cost-effectiveness and business opportunities. Transition themes and research priorities were originally selected on the basis of the competitive technological advantage and capabilities of the Netherlands (EZ 2002: 60; ECN 2004: 47). The criteria thus unduly neglect social and institutional innovations and accentuate marketable technological fixes[25]. New forms of energy business (such as energy service companies) and social change are being neglected. This practice undermines the goal of the Energy Transition project. Markets for radically new technologies are not easily formed. Such niche innovations may be ill-adapted to the existing system and often have cost disadvantages to incumbent technologies for the individual investor (whilst offering societal benefits such as emission reductions) (Jacobsson and Bergek 2004: 16). The criteria for experiments reduce options for long-term

[24] I.e. a lifestyle in 2050 that is 80% less carbon intense than today.
[25] In part this default to more familiar tools for civil servants is understandable as the TM model was by no means developed in detail at the time it was adopted (interviews 1, 18, 15). Thus, policy makers followed a learning by doing approach (EZ 2004a), relying very much on intuition (interview 17).

change and favour technological options that are already economically viable or close to the market.

Another mismatch between the ‘transitions’ storyline and the practices of the Energy Transition is the reliance on traditional policy instruments such as the UKR scheme to fund transition experiments and the EOS-DEMO scheme of the national research strategy to fund demonstration projects through grants. Instead of ‘policy innovations’ to foster system innovation, more traditional instruments persist and new ‘control policies’ to put the existing electricity regime under pressure as part of a transition strategy are absent. Putting the regime under pressure will inevitably harm stakeholder commitment by the incumbents dominant in the process and therefore seems politically difficult to achieve (Kern and Smith 2008). It has already been argued that the set up of the taskforce is very much in line with neo-corporatist polder-model policy making (Hendriks 2008: 1017).

These examples show that despite the reframing of the policy discourse in terms of the ‘transitions’ storyline, policy practices are shown to be quite resistant to change. This has been argued to be partly due to the persistence of existing institutional norms and routines and partly due to the diverging interests of EZ as well as of incumbent business actors which have not been sufficiently been reframed through the ‘transitions’ storyline.

4.7 Conclusions regarding the Dutch Energy Transition case study

This analysis has shown that in the Netherlands a coalition of researchers, consultants and civil servants, through collaboration in a number of programmes aimed at promoting sustainable technologies, started to share a storyline around the necessity for long-term structural changes in socio-technical systems. This discourse coalition used a routine policy strategy development process to promote a new ‘transitions’ storyline which emphasised the necessity of structural change in societal subsystems and the failure of existing policy

approaches to foster such change. The coalition made strategic use of existing policy commitments to innovation, liberalisation and creating business opportunities. Ideas around concrete proposals to steer such long-term change processes gained currency at a time when a routine review of the national environmental policy plan opened a ‘window of opportunity’. This process of discourse structuration culminated in the adoption of the ‘transition management’ approach in the Fourth National Environmental Policy Plan in 2001.

The institutionalisation of the ‘transitions’ storyline took place through the Ministry of Economic Affairs’ Energy Transition project. Central ideas of the storyline, around creating visions, setting up transition arenas and developing transition experiments to explore a number of pathways, were implemented and shaped practices of civil servants and stakeholders committed to the storyline. However, the analysis of the Energy Transition also showed that despite the novel language used, a number of institutional practices remained unchanged, such as the focus on technological change and business actors, the use of conventional policy instruments and institutions such as taskforces, or choosing transition experiments in terms of cost effectiveness and cost benefit analysis, which hinders more radical reform. This has been explained by a number of factors: the persistence of existing institutions which have not been altered by the new discursive commitments, the ambivalence of the ‘transitions’ storyline which led to a capture by incumbent actors, but also the prevailing interests of EZ and business actors.

The interpretative flexibility of the transitions storyline, which enabled its political success during the discourse structuration, made the ambitious storyline susceptible to being narrowed down during its institutionalisation. Because of this narrowing-down through the capture of the process by incumbent firms and the persistence of existing institutional norms such as polder model practices, it is doubtful whether this policy initiative will achieve its ambitions but it is too early to formally assess the success of this initiative.

5 Case Study II: The Carbon Trust in the UK

The following analysis sheds light on how and why the Carbon Trust was set up and how this new policy initiative was implemented.

5.1 The Carbon Trust

The Carbon Trust (CT) was announced as one of the policy initiatives of the 2000 UK Climate Change Programme. It was jointly set up in 2001 by DETR/DEFRA and DTI. The CT's mission is to 'accelerate the move to a low carbon economy' (Carbon Trust 2007a) and its work is organised around five complementary business areas: *Carbon Trust Insights* to inform businesses and policy makers, *Carbon Trust Solutions* to help companies to reduce their emissions, *Carbon Trust Innovations* to help develop low carbon technologies, *Carbon Trust Enterprises* to create new low carbon businesses using existing technologies and *Carbon Trust Investments* to finance the best ideas and business plans (Carbon Trust 2007a: 5). All CT activities are aimed at reducing carbon emissions in the short, medium and long term, which needs to be balanced with the aim of improving cost efficiency year by year. In the business area of developing low carbon technologies the timescale of the activities is aimed at medium- to long-term CO_2 emission reductions (Carbon Trust 2006a: 50-51). The initial expectation of Government was that the CT would save 0.5 million tonnes of carbon equivalent (MtC) each year by 2010 while the climate change levy package as a whole was estimated to save 5 MtC per annum by 2010 (DETR 2000: 125).

The Carbon Trust is often mentioned in the context of UK energy, climate and innovation policy (Foxon 2003; Wordsworth and Grubb 2003; Darkin 2006; Winskel, McLeod et al. 2006; IEA 2007) but has not yet been analysed in any systematic way. In particular, the process through which the Carbon Trust came about and the 'creation' of the rationale for setting up this kind of organisation has not yet been researched. So how and why did this new policy initiative come about, and how has it been implemented?

Before these questions can be addressed in more detail below, the following section will describe the dominant discourse in UK energy policy as a background to the subsequent discursive developments which are argued to have brought about the Carbon Trust.

5.2 The dominant 'free markets plus taxation' discourse in UK energy policy

This section will outline the dominant discourse in UK energy policy in the 1990s, in particular how climate change and the move to a low carbon economy have been considered.

UK energy policy, especially in the 1980s and 1990s, was mainly based on ideas around privatisation, liberalisation and competition (Helm 2005; Rutledge 2007). The former vertically integrated, state-owned monopolist utility companies supplying gas and electricity were broken up and privatised as far as possible. The ideas behind these policies were taken from neoclassical economic theory which suggested that competition would drive down electricity commodity prices, leading to lower retail rates (Kiesling 2009) and thus fulfil one of the central objectives of energy policy. Energy came to be seen as 'just another commodity' or, according to the then Energy Secretary Lawson, 'a traded good' (Helm 2003). In this discourse the "idea of turning the state monopolies from producer- to consumer-driven businesses had immense appeal" (Helm 2003: 258).

Scrase et al argue that

> "Advocates of market liberalisation see unfettered competition as the best guarantee to market access and secure supplies. This view remains the orthodoxy in almost all energy policymaking institutions (at least officially), and it continues to frame policies and shape financing decisions in both national governments and international agencies" (2009: 6).

In light of this dominant discourse the Department of Energy became unnecessary. Only a regulatory structure within which the market could operate would be required (interview 3). Consequently, the Department of Energy was abolished in 1992 (Helm 2002) and a

regulator for overseeing gas and electricity markets (Ofgem) was established to protect the interests of consumers (Rutledge 2007).

The support for this discourse was not limited to the Conservative Government but also continued during the 'New Labour' Government from 1997 onwards[26]. The Labour manifesto for the 1997 election also supported the idea to 'promote competition wherever possible' (Helm 2003: 288) and was in stark contrast with 'Old Labour' energy policy which had focussed on long-term energy security (Rutledge 2007). The 'New Labour' Government did not feel responsible any longer for planning how energy demand was to be met. Public energy R&D budgets plummeted (RCEP 2000). Interview evidence confirmed that these ideas were very much present in the thinking of civil servants at around the time the Carbon Trust was envisaged. The dominant idea in energy policy was to 'liberalise energy markets', 'privatise as much as possible', 'let the market do the job' and follow a 'market-based approach' to energy policy (interview 12). This necessarily required 'light touch government' to 'give the market room to breathe' (interview 8) and to 'minimise interference with markets' was a priority (interview 21). The dominant discourse was that 'government should never do anything unless you absolutely have to' and that 'markets deliver things' (interview 26).

Seen from the perspective of this discourse, the question is: under which circumstances would government interference with the market be acceptable? The government only intervenes in markets if it has identified a 'market failure', as the presumption is that consumer preferences are preferable over state planning (Helm 2003: 259). In the case of supporting innovation for a move to a low carbon economy several market failures played a role and two central ones are usually referred to (see for example Foxon 2003; Watson 2009). Firstly, there is underinvestment in R&D due to the 'public good' character of knowledge since firms cannot easily appropriate the benefits of their innovation, as a new product or process may easily be copied by competitors. This failure is used to justify

[26] According to Schmidt this is a criterion for a transformative discourse: that opposition parties are only able to win elections by embracing core ideas of the previous government's discourse (Schmidt 2001). Traditionally, Labour – in opposition since 1979 – had "naturally sided against the Lawson policy agenda" of 'energy as a normal commodity' (Helm 2003). Labour historically had favoured monopoly and state ownership.

public subsidies and tax credits for R&D investments. Secondly, the damage costs associated with carbon emissions are an externality in the energy market. Low carbon technologies are disadvantaged if these external costs are not fully internalised. Policies like the Climate Change Levy (CCL; which will be explained in more detail later) on the business use of energy, or the EU emissions trading scheme, are attempts to internalise these external costs. Again these ideas are based on neoclassical economic theory. Interviewees confirmed that in line with this discourse the rationale for UK energy innovation policy is based around the need 'to correct market failures' (interviews 3; 10; 11; 21; 23; 26) while at the same time minimising interference in markets (interviews 17; 20; 21; 26). However, there have been slight changes in that the 'New Labour' Government has been more open to the idea of 'market intervention' compared to the previous Conservative Government which "took the view that any intervention in the market was seen by definition [as] a bad thing. You had to really go through a lot of effort to demonstrate a market failure that justified the intervention" (interview 3).

According to this discourse, when there is an identified market failure which requires the government to intervene, it is preferable for this intervention to be based on market-based instruments such as carbon taxation or emissions trading (Helm 2003). Lovell at al. have described this as a 'market mechanisms' storyline in which the central claim is that "the market itself would provide a solution to climate change if it took into account the societal and environmental cost of carbon emissions" (Lovell, Bulkeley et al. 2009: 98). The absence of a price for carbon is seen as the central problem. The International Energy Agency has argued that the UK is one of the countries which relies most on market instruments (IEA 2007: 9). One reason for this preference according to neoclassical economics ideas is that apart from market failures there are also 'government failures'. These occur when governments perversely intervene in markets because of self-interests, limitations of their rationality and available information, as well as politics. The costs of government failures are often believed to be greater than the costs of market failures and so intervention makes things worse (Chang 2002: 540). The UK Government strongly supports this discourse and sees business as better placed to make decisions, for example about investments:

> "We believe a market based approach within a clear policy framework provides an effective way to help us to deliver our energy policy goals. This is because companies are best placed to weigh up and manage the complex range of interrelated factors affecting the economics of energy investments" (DTI 2007: 16).

Watson has argued that the notion that policy makers are ill-placed to pick winners and that markets are more able to do so is an article of faith in many policy debates in the UK (Watson 2009: 127). Another reason for the preference for market mechanisms is that economic incentives like the CCL are seen to be more politically acceptable than other interventions, which was an argument used in the public discussions around the CCL (Belfast Telegraph February 20, 2001).

The commitment to market instruments goes hand in hand with the idea that where there is a need for innovation support by the government this should be done in a technology-neutral way to avoid 'picking winners' (interviews 3; 4, 10; 17; 21). 'Picking winners' would violate the principles of liberalisation and minimum interference and poses risks of government failure. One of the interviewees eloquently describes this way of seeing the world:

> "So there is generally this movement against [picking winners] and that the market is [the] best instrument to decide. It just became an object of faith that we do not interfere with the market or we minimise interference with the market" (interview 21).

This element of the discourse is usually explained by the legacy of past government failures to back certain technologies in which historical examples such as the Concorde or the UK nuclear programme are used to justify that 'picking winners' is not desirable and is doomed to fail. This discourse is also publicly supported by influential academics, such as Helm (2006), who argue that government should only set appropriate frameworks and private investors should make choices about technology options.

The technology-neutral idea also precludes any kind of industrial policy. Green industrial policy approaches are usually based on an institutional economics discourse. Campbell argued that the assumptions on which institutional economics is based deviate sharply from neoclassical economics (in that institutional economics does <u>not</u> assume that markets occur

naturally; that private competition is necessarily the key to economic innovation and growth or that government intervention always undermines market efficiency). Campbell's research found that supporters of industrial policy in the US thus faced substantial problems as their ideas for policy programmes "did not resonate well with the dominant neoclassical paradigm" (Campbell 2001: 172). Similarly, in the UK there is an aversion to having an industrial policy strategy (interviews 4; 5; 21). Linking energy policy and industrial strategy is rejected in favour of a *laissez faire* approach (Watson 2009).

One of the difficulties of the 'free market' discourse is that on the one hand it accepts government intervention in principle but on the other hand it needs to contain this interference very strongly as otherwise the dominance of the market would be at stake. One of the ways to overcome this dilemma is to argue that although the models, following the logic of market failures, may have strong interventionist policy conclusions, these interventions are argued to be too difficult technically (too little information) or too dangerous politically (bureaucratic abuse or interest-group capture) to be put in place (Chang 2002). The technology-neutral element of the discourse seems to be doing exactly that: while the need for support for low carbon technologies in principle is accepted on the basis of the existence of market failures, the government cannot be entrusted with selecting which technologies to support. Any instrument therefore has to be designed in a technology-neutral way.

However, it has been acknowledged by civil servants that there is a tension between this principle and the need to make progress, e.g. with the development and diffusion of renewable energy technologies:

> "There is always this tension between being technology-neutral, technology-agnostic because it's not for government to 'pick winners'. But at the same time it is actually quite difficult to get anything moving unless you do do something intensive on particular technologies, do focus on the things which have the biggest chance of being material" (interview 12).

This acknowledgement has led to policies taking an options-based approach to technologies (interviews 4; 12) and an 'outsourcing' of the decisions about which technologies to support to independent organisations, such as the Carbon Trust (interview 10).

5.3 The 'developing low carbon technology' storyline

This section argues that against the background of the dominant discourse in UK energy policy in the 1990s described above, a new storyline emerged during the policy process around the 2000 Climate Change Programme. In the following, the central cognitive and normative ideas of the emerging storyline are analysed.

5.3.1 The Climate Change Levy as a revenue-neutral policy instrument

The 2000 Climate Change Programme established the Climate Change Levy (CCL) – a business energy tax aimed at cutting carbon emissions (HM Treasury 2001: 106). This idea followed the Marshall report, which argued that economic instruments are the most cost-effective way to reduce emissions (Dresner, Jackson et al. 2006). The idea to reduce emissions from business energy use through an economic instrument is very much in line with the 'free market plus taxation' discourse outlined above.

This cognitive idea, based on a 'logic of necessity' in line with neoclassical economic theory, was combined with the normative promise made by the Chancellor for the new tax to be revenue-neutral. Ministers wanted to demonstrate that the CCL is a business neutral activity and wanted to 'give something back to business' (interview 2). The idea was to not only recycle the receipts via a reduction in national insurance contributions but to help the companies suffering most from the impact of the CCL (interviews 2; 3; 4; 7; 10; 11; 12; 20; 22; 24). It was argued that recycling via general business taxation favours service companies over energy intensive businesses (Marshall Report 1998; also interview 10), so it was decided that some of the revenue should be directly targeted at energy efficiency improvements as well as low carbon technology development (interviews 2; 3; 7; 8; 10). This kind of hypothecation, returning business money back to business, was seen as highly desirable (interviews 11; 25) and tied in with the Government's wider agenda of 'taxing bads and reducing taxes on goods' (Environmental Audit Committee 2008). A key concern

for government was not to be seen to increase tax burdens and it therefore proposed a full recycling of revenues (Helm 2003: 357).

The main thrust in the discussions about the CCL levy was that this instrument needed to be revenue-neutral to avoid a further tax burden on UK business in order to avoid negative impacts on competitiveness, as for example Patricia Hewitt, the then Economic Secretary from the Treasury, insisted (Select Committee on Environmental Audit, Minutes of Evidence, Examination of Witnesses (Questions 120 - 139), Thursday 25 March 1999). It was within this context that the idea to set up a Carbon Trust gained support as a means to recycle CCL revenue back to business. The CT was part of the political deal at the time, which enabled businesses to agree to this downstream energy tax. The 'cognitive necessity' of having a tax on business energy use to correct a market failure was thus combined with a normative commitment to existing values in favour of not increasing the overall tax burden on businesses.

5.3.2 Having a Carbon Trust separate from government

The second core element of the emerging storyline was to set up an organisation responsible for recycling some of the CCL receipts separately from government. This element of the storyline was mainly based on normative arguments and followed a 'logic of appropriateness'. The idea of separating policy making and the delivery of policy is a deep seated norm in the UK civil service (interview 26). The idea of having an organisation like the Carbon Trust set up outside of government as a delivery body thus resonates with this institutional norm. It is a Government's general philosophy to set up 'focused delivery bodies with a clear remit' (interview 10). These and similar arguments were made by many of the interviewees when trying to explain why the CT was set up outside of government. They claimed that once it had been set up the CT could 'go away and deliver and clearly has an impact' (interview 5). It could 'get on with the job' and focus on 'delivering outcomes' (interview 13) and is seen as a 'really good delivery body' (interview 11).

The second key argument raised during this process for having the CT set up independently from government was to keep the day to day decision-making away from the politics of government. There was a perceived need to have an organisation at 'arm's-length from government', 'run in a non-political way', with 'freedom to operate'. The argument is that in order to have an organisation 'free from political interference' it is necessary to 'get it out from the departmental space' (interviews 2; 4; 5; 6; 7; 10; 12; 21; 20; 22; 23). The underlying assumption is that an independent organisation is able to make objective, non-political decisions based on commercial grounds, free from government control and free from lobbying while the government simply sets the framework and defines goals (interviews 2; 12; 23). This ability for 'rational decision-making' (interviews 17; 23) wherein something needs to 'make good sense in business terms' and be 'financially justifiable' (interview 11) is claimed to be superior to 'emotional' decision-making by government.

The idea of having the Carbon Trust set up independently from government resonates with neoliberal assumptions about politics, the role of the government and the free market. Chang characterises this worldview:

> "the neoliberal world of politics is populated by self-seeking bureaucrats, and politicians with limited capabilities operating under the influence of interest groups. In this view, politics opens the door for sectional interests to 'distort' the 'rationality' of the market system. The neoliberal solution to this problem is to 'depoliticize' the economy. This is, according to their view, to be achieved by restricting the scope of the state (through deregulation and privatization) and by reducing the room for policy discretion in those few areas where it is allowed to operate, for example, by strengthening the rules on bureaucratic conduct or by setting up 'politically independent' policy agencies bound by rigid rules" (Chang 2002: 549).

In the case of the 'developing low carbon technology' storyline, the 'market failure' argument provides a rationale for intervention and the support for moving to a low carbon economy is 'depoliticised' and outsourced to an independent organisation. This example shows how a dominant discourse shapes emerging policy ideas to make them palatable to policy makers, stakeholders and the public.

5.3.3 The Carbon Trust as a business-led organisation

The third core element of the 'developing low carbon technology' storyline was that the Carbon Trust should be a business-led body. This aspect of the storyline appealed to deep-seated normative convictions about a business-led organisation being more efficient, professional, effective, more 'trusted by business' and 'competent with money', better able to speak the language of business and having more of a 'can do' attitude compared to a non-departmental public body or a government department (interviews 2; 3; 5; 6; 7; 8; 10; 11; 12; 14; 19; 20; 22). In several public statements the Government emphasised that "a Carbon Trust is the most effective way of delivering the energy efficiency programme and funding research into low carbon technology" (see for example Select Committee on Trade and Industry, Annexes to the Report (I); 09.01.2001).

In terms of cognitive ideas another important reason for having a business-led organisation set up was the belief that 'business solutions matter' (interview 25). The leverage[27] of private investment is important and a business-led CT could act as a catalyst for this. Subsequently 'leverage has become one of the key metrics' of the CT (interviews 2; 4; 11; 12; 17; 18). The idea was that an independent, business-led organisation will have a real impact on the 'market place'.

In line with this thinking one of the key arguments for setting up a business-led body was also about the ability of such an organisation to attract high-caliber staff (interview 2) thereby ensuring success though the 'quality of the management team' (interview 5). The idea was to 'bring in business expertise' (interview 19) and get people 'speaking directly to business' (interview 7) and that attracting staff with a 'background credible to industry' would be necessary for the success of the CT (interview 22). This would help in 'creating a comfort zone for business' (interview 17). It was also argued that a different skills set would be needed to engage with business (interview 2).

[27] Leverage refers to the ratio between public and private investment. The CT for example invests alongside private investors and thus has a larger impact due to its leverage of private investment of about 1:10.

A report published by the National Audit Office cited two main reasons for the Carbon Trust being set up as a private company: “to allow it operational flexibility and to enable it to adopt a business focus” (NAO 2007b: 5). It also pointed out that setting up private companies was a more general approach that the Government was following, as with the Energy Saving Trust and the Waste and Resources Action Programme, for example.

5.3.4 The need for supporting energy efficiency and for developing low carbon technology

While the initial impulse for having an organisation to recycle revenues came from discussions around the CCL, the fourth element of the storyline established what exactly this body would be doing. The storyline outlined a dual role: on the one hand it would need to directly help businesses to cut their carbon emissions by fostering the take-up of available energy-efficient technologies and on the other hand it would need to support the development of low carbon technologies for the future. The storyline also amplified the idea that there are major economic opportunities for the UK in developing low carbon technologies and bringing these to market.

A business person centrally involved in setting up the CT remembers:

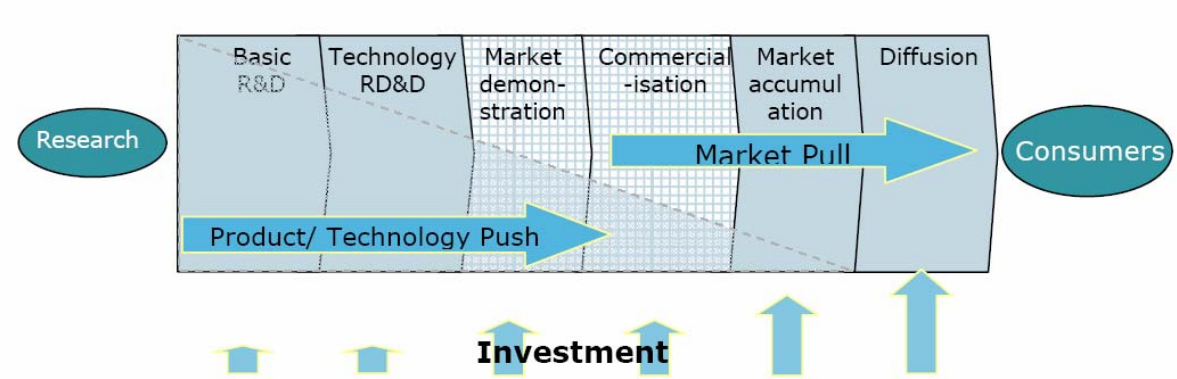
> “the key areas we were to look at was first of all energy efficiency […] The other areas we set up were the R&D programmes. So we wanted to do two things: you know you have got this valley of death. You have got new technologies that are near market that need commercialisation. It needs a lot of money between something that is near market and actually getting it to the market. […] We wanted to fund near market demonstration projects. We also wanted to put money into the carbon technologies of the future […] at that time there was a definite market weakness in all of these areas” (interview 11).

The idea of ‘valleys of death’ (interviews 2; 11) for new technologies or an ‘innovation gap’ (interview 10) are particular metaphors which were used to justify public support for low carbon innovation in this storyline. The idea is that new and emerging technologies ‘get stuck’ at particular stages of the innovation chain, for example in the demonstration phase (e.g. doing field trials), which usually requires a large step in terms of resources

needed (interview 10) (see Figure 7 and Figure 8). A senior civil servant explained that the task of the organisation to be set up would be to

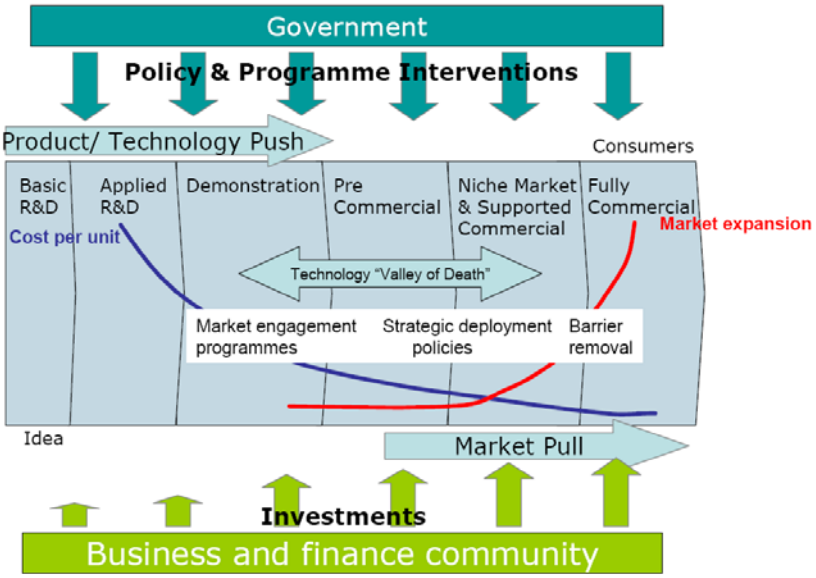
> "look at the process from early stage through demonstration, development, venture and out through the other side. You look at the whole [of] what we call the innovation chain. And you need an organisation that delivers that sort of model" (interview 7).

Figure 7: The metaphor of the 'innovation chain'



Source: (Grubb 2005: 118)

Figure 8: The metaphor of the 'valley of death'



Source: (Grubb 2005:121)

These metaphors were used to argue that public support is necessary to overcome the 'valley of death'/'innovation gap' between R&D funding and market pull instruments such

as the Renewables Obligation (RO). A senior civil servant acknowledged that "the concept of an innovation chain is a very very powerful tool to sell the concept of innovation to people who don't know anything about it" (interview 26). While DTI was already funding R&D into renewable energy technologies further from market, the idea was that the CT would focus on 'closer to market' technologies and on 'getting businesses ready to exploit these technologies' (interview 10).

5.4 The interactive processes of policy construction and communication

While the preceding section focussed on the substantive content of the key ideas of the 'developing low carbon technology' storyline, this section focuses on the interactive processes by which they have been generated and conveyed.

5.4.1 The coordinative discourse of policy construction

In the coordinative discourse the main interlocutors are policy actors and it is focussed on constructing a policy programme (Schmidt 2006a: 254). The main actors involved in the coordinative discourse around the CCL and the recycling of funds were:

- civil servants from DETR/DEFRA, DTI and the Treasury;
- elected officials such as John Prescott and Michael Meacher;
- think-tanks like the Institute for Public Policy Research;
- business people like Lord Marshall and members of the Advisory Committee on Business and the Environment (ACBE).

5.4.1.1 The discursive politics around the Climate Change Levy

Neither the Climate Change Levy nor the Carbon Trust ideas were part of Labour's 1997 election manifesto. However, in that manifesto Labour committed to reducing CO_2 emissions by 20% by 2010 compared to 1990 levels and more generally promised to "put

concern for the environment at the heart of policy-making" (Labour Party 1997). The manifesto also committed to promoting new green technologies and businesses to create jobs, win exports and protect the environment. Energy efficiency is mentioned as a priority in this context. Helm claims that while under the Conservative Government energy policy had played a minor role, "Labour would want a much more active policy framework, eventually committing itself to the elimination of fuel poverty and support of renewables and energy efficiency" (Helm 2003: 280). Interview evidence confirmed that under the Conservative Government energy efficiency had not been a priority and that when the Labour Government came in "there was a shift in gear" (interview 3). When Labour took more interest in energy efficiency, fuel poverty and carbon reduction targets

> "they began to see some of the shortcomings of the competitive market in relation to promoting energy reduction because they set up the market to be useful to reduce the cost of energy and low cost was driving high consumption till they began to see there were issues there. That's why they were interested in the possibilities of the climate change levy" (interview 3).

However, while Labour made the environment a key issue in the 1997 election campaign, the Party at the same time was also trying to avoid its reputation for being seen to dislike business (interview 11). In this endeavour, the idea of the Carbon Trust to help business to reduce energy use played a key role.

In the coordinative discourse policy actors often use ideas which are conveyed by 'policy entrepreneurs' (Schmidt 2006a: 254). Smith has argued that the Institute for Public Policy Research (IPPR) was such a "key policy entrepreneur pushing for an energy tax on business" (Smith 2004: 83). He points out that IPPR was influential in the Labour Party. Stephen Tindale at IPPR was commissioned to present ideas and strategies for environmental tax reforms by the then Shadow Secretary of the Treasury, Gordon Brown, before the 1997 elections. The Institute also ran seminars advocating a business energy tax, which were attended by civil servants as well as business and environmental groups. After the elections Tindale became a special advisor to the Environment Minister, Meacher (Beecroft 2002). Suggesting a market instrument to correct for a market failure was very much in line with the dominant energy policy discourse (see section 5.2).

These ideas were taken up by a high-level advisory report led by Lord Marshall in 1998. This report was of crucial importance as the CCL and other features of the 2000 Climate Change Programme were designed according to the recommendations of the report (Darkin 2006; NAO 2007a). The idea of a carbon tax had been around for some time and the 1990 Environmental White Paper 'This Common Inheritance' had already advocated the use of economic instruments (Helm 2003) but rejected the use of a carbon tax on fossil fuel for the immediate future (Aldhous 1990). Against this background

> "Labour set up a task force to look into the case for an energy tax, and asked Lord Marshall to lead it. The specific remit was to consider how best to use new economic instruments to improve the industrial and commercial use of energy and help reduce emissions of greenhouse gases. Marshall had not been previously known for his environmental expertise, but he did have wide industrial experience, and therefore could be regarded as better able to 'sell' an unpopular tax to industry. He also fitted into the New Labour vogue for businessmen, rather than academics or experts in helping to shape policy" (Helm 2003: 354).

Marshall was a former president of the Confederation of British Industry (1996-1998), had been chairman of British Airways and was a well-respected business leader (Smith 2004: 85). The report came out in November 1998 and advocated a tax to tackle business emissions, but argued that it should be designed in a way that would not harm the international competitiveness of British industry. Revenues should be fully recycled. It mentioned a 'Carbon Trust' as one possibility[28] for recycling at least part of the receipts. The report recommended that

> "the revenues are recycled in full to business, with at least some of the revenues channelled into schemes aimed directly at promoting energy efficiency and reducing greenhouse gas emissions – perhaps through 'carbon trust' type schemes to promote low carbon technologies, and/or energy audits/advice for SMEs" (Marshall Report 1998: 2).

Arguments in favour of schemes to promote energy efficiency or emissions reductions were that recycling via general business taxation would not provide any incentives for improving energy efficiency and emissions reductions and that it would favour low-energy users over energy-intensive businesses. While the report mentions the idea of a Carbon

[28] The other option considered in the report was recycling via general business taxation such as corporation tax or employers' National Insurance Contributions.

Trust it also states that this proposal originally came from ACBE (Marshall Report 1998: 26). A senior energy researcher claims that the Marshall report was "really quite influential in shifting that agenda forward because it was the first time anybody from business had come and said 'yeah we need economic instruments to take that forward'" (interview 24). The Marshall report provided the cognitive and normative basis on which the Government introduced the CCL and linked the tax proposal with ideas about how to recycle the revenues.

In the 1999 Budget Report the Government argued that it was in agreement with the recommendations of the Marshall report that there was a role for a tax within a wider policy package. The budget announced the CCL and stated

> "The Government also agrees with Lord Marshall's recommendation that the levy must be designed in a way that protects the competitiveness of UK firms. The Government therefore intends to recycle the revenues to business through a cut of 0.5 percentage points in the main rate of employer NICs [National Insurance Contributions]. Businesses will also benefit from schemes aimed at promoting energy efficiency directly and stimulating the take-up of renewable sources of energy, like solar and wind power. The introduction of the climate change levy will therefore entail no increase in the burden of taxation on business" (HM Treasury 1999: para 5.64).

The Government thus accepted the discursive framing of the problem and the linkage between competitiveness concerns and direct incentives for energy efficiency and the take-up of renewable energy technologies[29].

The setting up of the Carbon Trust was thus part of a political deal between the Government and interest groups that was linked to the CCL (interviews 2; 3; 4; 5; 7; 10; 11; 12; 20; 22; 24; 26; also Environmental Audit Committee 2008: 28). An observer notes: "it was part of the political trade-offs at the time. In order to get the CCL business had to get a certain price for it to happen and so a business-led CT was almost the inevitable outcome" (interview 24). Out of the discussions about the necessity for a new business energy tax a discourse coalition formed which linked the new tax with the need for a recycling

[29] This resonates with the findings of Barry and Paterson who argued that 'New Labour' saw ecological modernisation strategies as viable "to the extent that policy initiatives can be articulated as contributing to the 'competitiveness' of a national economy" (Barry and Paterson 2004: 779).

mechanism used to foster the take-up and development of low carbon technology. The discourse coalition in support of this political 'deal' did not only include government, business interest organisations and experts such as IPPR, but also green lobby groups. The environmental think-tank Green Alliance was involved in the preparation of the Marshall report by giving evidence to his team[30] and it also engaged several times between 1999 and 2001 with ACBE through its emissions trading NGO liaison group. The environmental organisations were very much in favour of a business carbon tax and also supported the idea of hypothecation (interview 22).

5.4.1.2 The discursive politics around the idea of having an independent, business-led Carbon Trust

While the previous section focussed on the discursive politics around the CCL, this section will focus on the politics around the recycling of funds through an independent, business-led organisation. It will be argued that the Advisory Committee on Business and the Environment (ACBE) and a small number of civil servants played a key role in establishing the storyline which subsequently led to establishing the Carbon Trust.

ACBE was set up in 1991 by the Secretary of State for the Environment and the Secretary of State for Trade and Industry. It consisted of a group of senior business leaders "who are appointed on a personal basis [and] who are charged with taking a strategic view on some of the key environmental issues of the day" (interview 11). ACBE reported to the Cabinet Office and its membership was appointed by the Secretaries of State for the Environment and for Trade and Industry. While the Confederation of British Industry's (CBI) environmental committees used to be dominated by the 'smoke-stack industry', membership of ACBE was more progressive (Smith 2004). During the process of policy construction around the CCL, ACBE published three reports which were of major importance in designing the Carbon Trust (*'Climate Change: A Strategic Issue for Business'*, 1998; *'Carbon Trusts – Exploiting the Potential of Low Carbon Technology'*, 1999; *'ACBE Proposals for Establishment of the Carbon Trust'*, 2000).

[30] Lord Marshall in the foreword to his report explicitly thanked ACBE and the Green Alliance for their time spent responding to the consultation.

ACBE's first report promoted the idea that if a carbon tax is thought to be necessary to meet the Government's carbon reduction targets, then this tax should be revenue-neutral to prevent negative impacts on business competitiveness. This should be done by encouraging low carbon technology (ACBE 1998). In this context ACBE mentioned the idea of Carbon Trusts for the first time in the political discussions. As discussed above this idea was subsequently taken up in the Marshall report.

In its second report ACBE recommended that the Government should adopt the principle of an independent, business-funded Carbon Trust as an integral component of the Climate Change Levy. The report argued that the revenues "should be recycled to support research, innovation and investment in a way which will directly stimulate more rapid take up of low carbon technology" (ACBE 1999: 11). ACBE was particularly interested in the "development of mechanisms such as Carbon Trusts to allow greater business involvement in recycling of revenues" (ACBE 1999: 2).

ACBE's third report was the most detailed and covered not only questions around the mission of the to-be-established Carbon Trust, but also a workplan, level of funding, its cooperation with other initiatives, governance and management structures and its embedding within a wider policy framework. ACBE recommended that the CT be established as a company limited by guarantee "in order to provide independence, and flexibility in objectives, powers, and membership, and to enable it to seek a variety of funding sources" (ACBE 2000: 2). It also strongly stressed the idea that because the CCL revenue comes from business and needs to be recycled back to business, the CT should be business-led to "gain the confidence of business, and support for its activities" (ACBE 2000: 2). ACBE also recommended that the CT would need to be closely engaging with government in policy debates and "help to steer Government thinking" (ACBE 2000: 8).

Most of these ideas promoted by ACBE have been identified in section 5.3 as key aspects of the 'developing low carbon technology' storyline and were subsequently taken up in the design of the CT. The Government repeatedly referred to the recommendations of ACBE in

explaining and justifying this policy initiative. Interviewees confirmed the major importance of ACBE in developing and driving forward the ideas around a Carbon Trust (interviews 2; 3: 8; 10; 11; 12). ACBE was a very influential body at the time and had free access to cabinet members (interview 11).

ACBE was involved in this process not only by giving policy advice in the form of reports but also in terms of close face to face interaction between itself and DETR civil servants. A project team was set up which included civil servants from DETR and ACBE members. During the year 2000 the DETR team engaged extensively with ACBE to further develop the idea of a CT based on ACBE's 1999 report (interview 2). The detail of what the CT would do, its mission, its area of activity and how it would be governed was sketched out by two civil servants from DETR and two ACBE people (interview 3). ACBE seconded a business person to DETR to help with this process. The secondee explained that DETR was willing to support ACBE's idea of establishing a business-led CT but needed support from ACBE because '"setting up companies and establishing governance, sorting out corporate budgets etc. etc. isn't the sort of thing that we [DETR] do. We haven't got the time or money to hire someone, so lend us someone for free' and that's how I came in" (interview 8). The senior civil servant in charge of the 'Energy, Environment and Waste' directorate who was responsible for the recycling of CCL revenues also acknowledged the central role of ACBE: "One of the members of my team was given the job of creating the CT, working with Ian Stephenson, and they [ACBE] put a lot of work in for us" (interview 3). Ian Stephenson from ACBE was seen by several interviewees as crucial in the setting-up of the CT (interviews 2; 3; 7). The cooperation went so far that according to a DETR press release Ian Stephenson "led the team that designed the Carbon Trust"[31].

This close cooperation led to trust between officials and ACBE members who

> "were thinking along similar lines. There should be either Carbon Trust or Carbon Trusts whose job it would be to work with business to find technologies, to develop technologies to reduce emissions, to improve energy efficiency" (interview 2).

[31] DETR press release, 12 February 2001, http://www.gnn.gov.uk/content/detail.asp?NewsAreaID=2&ReleaseID=24686.

The central rationale for developing the Carbon Trust model and its design was thus constructed in close interaction between civil servants and ACBE and led to the 'developing low carbon technology' storyline. The business involvement lent credibility to the storyline and helped convince ministers about this policy programme. The Government followed the storyline and announced a business-led Carbon Trust, set up as a company limited by guarantee.

All of this has to be seen in the context of 'New Labour' more generally. 'New Labour' has been very careful to involve business in its decision-making and has effectively engaged with the business community (Darkin 2006). 'New Labour' tried to detach itself from the union interests and made clear efforts to secure business confidence by positioning themselves openly as a pro-business party (Gamble and Kelly 2001; Ludlam 2004). Central to achieving credibility for the 'New Labour' project was the adoption of policies which the financial markets in the City considered sound such as a code for fiscal stability. Labour, since 1992, courted domestic industry, the City ('prawn-cocktail offensive') as well as international investors. Hay termed this political strategy as 'capital appeasement' with Labour presenting themselves as the representative of the interests of industrial and financial capital (Hay 1999)[32]. The 'New Labour' mantra was that 'minimal government is good government' because the complex and increasingly integrated world economy was seen as constraining the potential role of government (Watson and Hay 2003). Market advocacy and 'capital appeasement' was seen as a necessity in a world of free capital movement. Under 'New Labour', "the market, and with it the private sector, has assumed a central place, and the commitment to the public sector as both morally superior and economically more efficient has disappeared" (Gamble and Kelly 2001: 182).

[32] Hay argues that 'New Labour' behaved as if the structural dependence thesis was true (Hay 1999: 149). This thesis claims that the state must respect and protect the interests of capital as it is dependent on its investment and that parties seeking election must accommodate the perceived preferences of capital if their election is not to produce an exodus of capital and subsequent economic crisis.

5.4.1.3 The departmental politics around the need for a Carbon Trust

Two departments in particular were closely involved in the coordinative discourse of policy formulation: DETR (now DEFRA [33]) and DTI (now BIS). The Treasury indirectly contributed to setting up the Carbon Trust by supporting the CCL and insisting that it should be revenue-neutral, which gave rise to discussions about different recycling mechanisms.

Department for Environment, Transport and the Regions

The Department for Environment, Transport and the Regions (DETR) at the time was responsible for environmental, climate change and energy efficiency policy and was therefore the lead department for the Climate Change Programme. DETR was led by the Deputy Prime Minister, John Prescott, who was quite remote from the process and did not play a crucial role in setting up the CT according to civil servants (interviews 3 and 7). Prescott is claimed to have agreed to the CT idea because it was "shiny, happy, M-plated new stuff" which Prime Minister Tony Blair liked and so he liked it too (interview 7), but he did not have a great deal of input into how the CT would operate (interview 3). However, he was involved in the selection of the chairman and made sure there was political cover from the Treasury and the Prime Minister.

There was some internal opposition against the idea of a Carbon Trust. According to interview evidence, Meacher, the Environment Minister at the time,

> "was vehemently opposed. I had to brief around him. It was really quite difficult in the end because it wasn't going to happen according to him but we had the Treasury on board and we had business onboard" (interview 7)[34].

[33] DEFRA was set up in June 2001 when the Ministry of Agriculture, Fisheries and Food (MAFF) was merged with part of the Department of Environment, Transport and the Regions (DETR). In 2008 a new Department for Energy and Climate Change was created which took over responsibility for energy policy (from DBERR) as well as climate and energy efficiency policy from DEFRA.

[34] The interviewee explained Meacher's opposition by claiming that he was lobbied by interest groups benefiting from EST programmes which therefore wanted to see EST's budget grow instead of setting up a CT (interview 7).

The discourse coalition in favour of the Carbon Trust thus managed to overcome some internal resistance by forming an alliance with the Treasury and business. It was mainly the 'pragmatic market civil servants' who were supportive of the CT idea (interview 7). Other civil servants were not initially convinced as the feeling was "oh no let's not set something else up again" (interview 7). However, proponents were able to make the case that there was a real need for a body to take these ideas forward because "this is not something that you can leave to existing mechanisms to implement because they haven't worked for nearly 25 years. Something else is needed. It needs to be out there. It needs to be business" (interview 7).

Department for Trade and Industry

DTI at the time was responsible for innovation policy and business support as well as energy policy. While DETR was the lead department for the Climate Change Programme and therefore also the Carbon Trust initiative, the ideas around developing low carbon technologies touched on DTI's remit. However, DTI was not involved in the initial thinking about the CT (interview 12). According to interview evidence DTI took a supportive stance towards the possibility of establishing a Carbon Trust, but emphasised that this initiative was DETR led and that they would not contribute additional funding (interviews 2; 12; 19). DTI took part in all the meetings, was involved in the process and consulted with DETR (interviews 8; 19): "They allowed the DETR to get on and innovate and so I certainly would not think it is fair to portray their involvement as minimal or disengaged. I think they were interested and very helpful" (interview 8). Another interviewee confirms that the business-support part of DTI rather than the energy part of DTI was taking an interest in the CT idea (interview 3). Their main concern was the potential impact of higher energy prices on business competitiveness and therefore the idea of recycling the revenues back to business to help them improve their energy efficiency appealed to DTI. While being supportive, DTI did not engage with the detail very much. A senior DEFRA civil servant confirmed: "I don't remember them being particularly dominant or forceful in thinking about how the Carbon Trust might be created, what its remit might be or anything of that sort. I think they left it entirely to us" (interview 3).

Civil servants from the energy side of DTI did not see an overlap with their own policies such as the renewables obligation (RO) or PV grant programmes and thus did not perceive the initiative as a threat:

> "our policy was aimed primarily at electricity generators. The CT was not targeting primarily electricity generators. It was targeted primarily at ordinary businesses trying to get low carbon technologies into ordinary businesses" (interview 19).

Another interviewee revealed that in fact there were discussions about whether certain DTI-funded renewables programmes should be taken up by the Carbon Trust but it was decided against as DTI did not agree. DTI's position was that the rationale for the CT

> "was much more focussed around businesses and closer to market stuff, getting businesses ready to exploit these technologies etc. whereas the DTI programme was funding much more further from market research. And so the fit wasn't quite there" (interview 10).

These points illustrate that although developing low carbon technologies was a central element of the storyline, DTI did not feel threatened by this initiative but rather perceived it as complementary to their own policies because the CT would promote innovations 'closer to market' and focus on energy efficiency. The DTI's focus was on electricity generation technologies that were 'further from market'. The division of labour was thus based on the linear understanding of innovation, which was part of the storyline.

Treasury

The Treasury supported the idea of the CCL but insisted on it being revenue-neutral (HM Treasury 1999; interviews 10; 12; 24). The idea of hypothecation had already been previously accepted by the Treasury for the landfill tax (interview 7). The Treasury's main worry was the impact of the planned levy on economic competitiveness and the Chancellor thus emphasised from the beginning that this policy initiative was about shifting the tax burden rather than increasing overall taxation (interview 3). Similar concerns were voiced by DTI. The idea of recycling money back to business to help them become more energy

efficient and thus reduce the impact of the levy on competitiveness was therefore appealing to the Treasury. The Treasury accepted the link that the coalition promoting the 'developing low carbon technology' storyline forged between the necessity to recycle the CCL revenue and the idea of providing direct incentives for energy efficiency and the take-up of low carbon technologies.

Summary

The 'developing low carbon technology' storyline was supported by all of the involved departments because it allowed them to advance their departmental interests. It spoke to the Treasury's concern for revenue neutrality, gave DETR/DEFRA the opportunity to substantially increase funding for their energy efficiency work, was not perceived to negatively interfere with the interests of the DTI's energy group and was in line with DTI's business group's interest in fostering green business. ACBE and Lord Marshall, with their business credibility, played a key role in promoting this storyline which helped to foster agreement between departments. The discourse coalition did not only include civil servants from various departments but business actors were also centrally involved in developing the policy programme around the Climate Change Levy and the Carbon Trust. A central success factor in achieving agreement was the interpretative flexibility of the storyline, which allowed actors to interpret the initiative as being in line with their interests.

5.4.2 The communicative discourse deliberating and legitimising the 'developing low carbon technology' ideas

Important actors involved in the communicative discourse around the 'developing low carbon technology' storyline were:

- Parliamentarians through different select committees of the House of Commons (Environmental Audit, Trade and Industry, Environment, Transport and Regional Affairs, Science and Technology) and the House of Lords Select Committee on the European Communities;
- Government spokespeople;

- Interest groups such as ACBE, ACE, RSPB, CBI, WWF, the Association of Electricity Producers, the Combined Heat and Power Association and the Green Alliance.

One of the most important issues for gaining public acceptance of the storyline around the CCL and the Carbon Trust was the idea of revenue neutrality and the recycling of receipts. This is particularly true for businesses, as several interviewees pointed out: "the issue was when the CCL was established, business bought into it only on the premises that money would be recycled" (interview 24; similar points were also made by interviewees 2; 3; 4; 7; 10; 11; 12; 20; 22; 25). Independent experts like Terry Barker (University of Cambridge and Chairman of Cambridge Econometrics) publicly supported the idea that the sectors most affected by the CCL would have to be safeguarded in order to achieve a reasonable consensus, and he regarded the idea of having a Carbon Trust as just such a suitable safeguard (Select Committee on Environmental Audit, Minutes of Evidence, Examination of Witnesses (Questions 40 - 59), Tuesday 16 March 1999).

The support of business actors for the storyline also played an important role in the communicative discourse. The Marshall report was not only very important in the coordinative discourse, as analysed above, but also contributed to the communicative discourse. Almost any public statement by the Government, for example about the design of the CCL or the recycling of its revenues explicitly referred to Lord Marshall's recommendations and the fact that the Government was following the report's suggestions. One example of this is the Government's response to a request by the Environmental Audit Committee, which had recommended the Government to consult on a scheme to promote investment in specified environmental technologies. The Government's reply explicitly referred to the Marshall report in saying that "[t]he possibility of introducing tax reliefs for energy saving technologies was one of the options discussed by Lord Marshall"[35] (Select Committee on Environmental Audit Eighth Report, Appendix 1). The 2000 Climate Change Programme explicitly referred to the 1999 ACBE report and emphasised the commercial opportunity associated with developing low carbon technologies and explained

[35] This ideas was later implemented through the energy technologies list administered by the Carbon Trust.

the CT as part of a strategy to equip businesses to move to a low carbon economy. In line with its belief in the importance of business advice[36] the Government used the ACBE reports and the Marshall report to foster the credibility of the 'developing low carbon technology' storyline.

Some of the main criticisms which emerged in the communicative discourse around the 'developing low carbon technologies' storyline were to do with the question of why a new organisation was needed instead of expanding the remit of the Energy Saving Trust and whether the Carbon Trust would have too little funding to support both energy efficiency and renewable energy technologies. These controversies will be discussed in more detail below.

Most importantly, there was a controversy as to whether the new Trust should be part of the Energy Savings Trust (EST) rather than being set up as a separate organisation. Initially, there was some strong opposition from interest groups such as the Association for the Conservation of Energy (ACE), the British Energy Efficiency Federation (BEEF), the Royal Society for the Protection of Birds (RSPB) and the Confederation of British Industry (CBI) to having the CT set up separately. These groups argued that instead of setting up a new organisation the remit of the EST should be expanded. A senior civil servant from DETR involved in the process of setting up the CT recalled that ACE and BEEF, as well as the EST itself, fiercely opposed the setting up of a new body and instead wanted to develop a business stream within the EST (interview 7). One argument from ACE was that there is no "need for a new bureaucratic device in the form of any Carbon Trust" and that the EST "has a proven track-record regarding the effective operation of energy efficiency schemes, which should be capitalised upon" (Select Committee on Trade and Industry, Appendices to the Minutes of Evidence - Ninth Report, Appendix 11). The CBI argued that setting up a new organisation "would take time to set up (probably two years) and waste precious funds unnecessarily" (Select Committee on Environmental Audit Minutes of Evidence, 13.06.2000, Appendix 1, Annex 1). Also, the RSPB argued that the EST should be

[36] As mentioned earlier Helm argued that New Labour relied on advice from businessmen rather than academics or experts in helping to shape policy (Helm 2003).

expanded rather than a new body like the CT be established (Select Committee on Environmental Audit Minutes of Evidence, Memorandum submitted by the Royal Society for the Protection of Birds). In addition to this, the Select Committee on Environmental Audit also initially suggested that the EST should administer the funds for sustainable energy from the Climate Change Levy. In response to a query by the Committee about why the Treasury felt it was necessary to set up a separate body, a spokesperson for the Treasury argued:

> "The Carbon Trust has a very clear role in taking forward work which has been carried out in the past but in a more effective way, not least because it will have significant extra resources available from the proceeds of the Climate Change Levy" (Select Committee on Environmental Audit Minutes of Evidence, Examination of witnesses (Questions 40-59), Wednesday 14 March 2001).

This quote illustrates again how the effectiveness argument was used to counter criticisms and to promote the idea of an independent, business-led Carbon Trust.

A further criticism by ACE and CBI was that the suggested funds for the CT were too small to support both energy efficiency and R&D into renewable energy technologies and that it should focus on energy efficiency measures to help the businesses paying the levy. The CT was not seen as an appropriate mechanism for developing renewable energy technologies and both groups felt that priority should be given to supporting energy efficiency (Select Committee on Trade and Industry Appendices to the Minutes of Evidence - Ninth Report, Appendix 11; Select Committee on Environmental Audit Minutes of Evidence, 13.06.2000, Appendix 1, Annex 1).

A key civil servant remembered the debate:

> "I do recall that we had quite a long debate about whether the best way to do this was to create a separate Trust or whether to expand the remit of the EST. And the business view on that was really very instrumental because those at the business end looked at the EST, saw that it was essentially a business to consumer organisation and felt that they wanted something which was focused much more on business to business. And also I think something that they saw themselves having more direct influence over than the EST which had a board which reflected its main mission" (interview 3).

So while discursively the case was presented as one of 'needing a business-led body' with the right skills set, behind closed doors 'politics as usual' was playing out. There was "the feeling was that the EST wasn't the right place for that, because the EST was very much associated with domestic savings, maybe small businesses but not big businesses" (interview 22). The "CBI and the intensive energy user group were very much the view that the EST was a fundamentally flawed vehicle and you needed to set something up that had a much more business focus" (interview 26). ACBE, as an lobby organisation mainly made up of large businesses, therefore supported the CT to be set up separately instead of giving the funding to the EST. An important factor was that these (Climate Change Levy-paying) businesses had an interest in ring fencing this money. The fear was that in the EST it could 'leak across' different areas (interview 8). Also businesses believed to have fewer possibilities of controlling the spending as the board of the EST was already established representing other interests (interview 3).

Other business interest organisations of sectors which were main beneficiaries of the existing EST programmes such as insulation manufacturers, the lighting industry or the British Energy Efficiency Federation lobbied heavily for the new funding to go to the EST (interviews 7; 11): "There were some very difficult meetings. It wasn't easy. It was a lot of vested interests and on the face of it quite a lot of money and so everybody wants a slice of the cake" (interview 11). Also the EST itself lobbied for having a business stream alongside their domestic stream of work (interviews 7; 11).

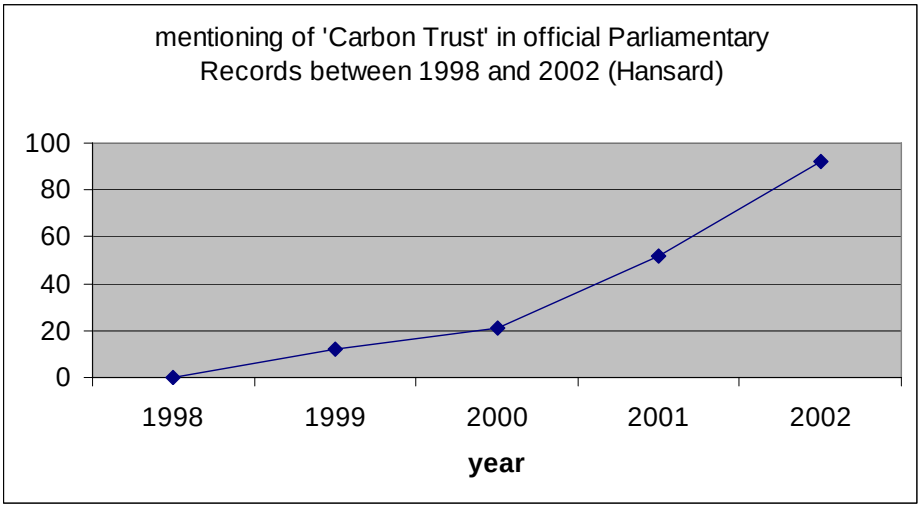
These examples demonstrate how interest-driven lobbying took place during the discussions about the possibility of setting up a Carbon Trust. They show how incumbent business actors were trying to influence the policy development in line with their interests. Other business actors such as ACBE were in favour of setting the Carbon Trust up separately of the EST. What this simple reference to interests does not provide, therefore, is an explanation as to why the Government decided to set up the Carbon Trust separately from the Energy Saving Trust. The argument is that while 'politics as usual' played a role in this policy process, it does not necessarily explain the policy outputs without a reference

to broader discursive developments which add credibility and legitimacy to some views more than to others.

Parliamentarians were involved in the communicative discourse mainly through a number of select committees (House of Commons Select Committees on Environmental Audit; Trade and Industry; Environment, Transport and Regional Affairs; Science and Technology; and the House of Lords Select Committee on the European Communities) in which the ideas around the CCL and the CT were discussed. This sometimes took the form of discussions with ministers as examinations of witnesses. Some parliamentarians also raised critical issues using the parliamentary 'questions for written answer' procedure to elicit statements or explanations from the Government, to which the Government mainly replied using core arguments of the 'developing low carbon technology' storyline. One concern raised by parliamentarians was that ACBE was comprised only of large businesses. The role of ACBE was cross-examined by the House of Commons Select Committee on Environmental Audit and the then chairman of ACBE David Davies admitted that the advisory committee mainly represented larger businesses but also stressed that members served in a personal capacity and did not represent specific interests and bodies (Select Committee on Environmental Audit, Minutes of Evidence, 6 May 1998). Several MPs asked very critical questions about the way in which ACBE gave advice to government without taking on board the views and interests of SMEs.

However, while there was some discussion amongst parliamentarians in a variety of select committees, there was very little involvement of parliamentarians during the crucial years when the Carbon Trust was being discussed and designed by the concerned departments and interest groups (between 1999 and 2000). Only in the year when the Carbon Trust was set up (in 2001) was there an increased interest in this policy initiative (see Figure 9).

Figure 9: Parliamentary Records on Carbon Trust



(Source: own compilation, based on results of key word search for 'Carbon Trust' in Hansard)

5.5 The institutional context in the UK

As described in the theoretical framework, institutions can have an important impact on policy processes. The framework combines attention to formal institutions such as governance structures or the electoral system and informal institutions such as organisational routines and norms.

One institutional feature of the UK which aided the development of the Climate Change Programme, including the CCL and the Carbon Trust, was the concentration of power in central government. The UK has been characterised as a centralised and unitary state (Lijphart 1999; Saalfeld 2003; Hill 2005; Schmidt 2006a). The 'first-past-the-post' electoral system in the UK (Lijphart 1999) leads to a concentration of executive power in one-party, bare-majority cabinets while power in coalition governments is naturally more dispersed. Coalition governments in the UK are rare. This institutional context matters insofar as the UK's unitary, majoritarian governance system means that government can create new policies without too many checks and balances. The opposition is generally weak and does not have many opportunities to scrutinise policy programmes as their ability to generate information is limited, while the government is aided by the civil service (see

Saalfeld 2003). This enabled the Labour Party after they gained office in 1997 to revive energy policy and design and implement the 2000 Climate Change Programme, including the Carbon Trust, without the need to convince a coalition partner.

Despite this power concentration, both the Labour Party and the Conservative Party have followed

> "a strategy of preference-accommodation. They have gradually adopted a greener rhetoric and developed a set of moderate policies to demonstrate that the environment would be safe in their hands, but they have resisted turning the environment into an area of party competition" (Carter 2007: 132)[37].

The CCL can be seen as such a moderate policy which is in accordance with the dominant discourse and thus was not very controversial. Carter also points out that Labour "briefly struck an upbeat attitude towards the environment in the immediate aftermath of its 1997 election victory, but failed to sustain this new-found enthusiasm" (Carter 2007: 133). This is claimed to have to do with the experience of the fuel duty escalator and the fuel blockade in 2000. The short phase of environmental enthusiasm led to the adoption of the Climate Change Programme (including the CCL and the Carbon Trust).

However, as this policy process coincided with the devolution process, these institutional changes also had some implications for the setting up of the Carbon Trust. Devolution started with the Labour Government in 1997, which initiated a process by which a quasi-federal model emerged in the UK (Winskel 2007). Labour's devolution policy created a Scottish Parliament and a Northern Ireland Assembly with extensive legislative power and a Welsh Assembly with 'secondary' legislative discretion in applying UK legislation in the Welsh context (Jeffery 2000: 10). While overall energy policy remained a responsibility of the central government, the promotion of renewable energy and energy efficiency was devolved, to the Scottish Executive (Winskel 2007). Wales has more limited powers as neither energy policy nor promotion of renewables or energy efficiency is a devolved

[37] A preference-accommodating strategy "seeks out the perceived wants of the voters in the fashion of a brand manager" (Leggett 2005: 551). Legget argues that 'New Labour' has mainly followed this strategy of identifying and chasing supposedly fixed preferences and thus failed to engage in more transformative politics to mould the preferences of the electorate.

responsibility. However, support for innovation as well as environmental policy competences are devolved to the Welsh Assembly. This delegation of political power influenced the setting up of the CT insofar as central government had to convince the devolved administrations about the idea of a Carbon Trust (interview 8). While the decision to introduce the CCL was considered by the Treasury as a UK tax measure outside the discretion of the devolved administrations in Scotland and Northern Ireland, which initially caused some disquiet (*Belfast Telegraph*, February 20, 2001), during the process of the set-up of the Carbon Trust the devolved administrations had a choice of whether or not to support this policy initiative financially, as both renewable energy and energy efficiency policy were devolved competencies.

While the Carbon Trust was suggested to be a UK-wide body the communicative discourse emphasized that it would allow for 'local voice'. In its advice on how the Carbon Trust should be set up ACBE had recommended that the CT be a UK-wide body and would need to be run in cooperation with the devolved administrations to ensure they meet local business needs (ACBE 2000). The 2000 Climate Change Programme took up this line of argument and indicated the government's intention to set up the CT as a UK-wide body "taking into account the needs and characteristics of businesses in Scotland, Northern Ireland and Wales" (DETR 2000: 75) and promised the devolved administrations as funding stakeholders to be involved in the running of the Trust. These instances show how the communicative discourse especially in the devolved parts of the UK tried to marshal public support as well as political support from the devolved administrations by appealing to norms about having a 'local voice' and putting 'local needs' centre stage. The project team preparing the Carbon Trust initiative, for example, went to Cardiff to explain the plans in a televised committee meeting to win over the Welsh Assembly. This process somewhat delayed the setting up of the Carbon Trust: "It was quite a lot more brokering that needed to be done to get it to happen" (interview 3). In return for agreeing to the idea and contributing funds the devolved administration wanted to be directly represented on the board.

More importantly, the devolution process created new policy arenas in which the devolved administrations took certain views that were different to those of the central government. The 1998 Scotland Act transferred some aspects of policy to the devolved administrations:

> "While a narrow reading of these arrangements may have offered little scope for devolved policy making, in practice, the Scottish Executive and Parliament interpreted their powers widely enough to encourage the development of a distinctive policy arena in energy" (Winskel 2007: 186).

While in the UK the national government had not been in favour of creating industrial sectors, Scotland developed this ambition with regard to marine technologies[38] (Winskel 2007: 186). This subsequently also contributed to a change in thinking in central government (interview 5; also see Watson 2009: 140 for similar arguments). In particular, Scotland put pressure on the national Government by setting out ambitious targets for Scottish renewable electricity generation which went well beyond the UK targets (Winskel 2007). The new policy arenas are also loci of alternative discourses. For example "[t]he emerging Welsh Assembly Government policy discourse reproduces some of the economically based ideas of national policy, but also introduces the global environment as a strong driver of their energy strategy" (Stevenson and Richardson 2003: 111). The Welsh Assembly Economic Development Committee published a consultation report in 2002 with a strong focus on the sustainable energy strategy, with environmental concerns taking precedence over other energy policy goals and a strong focus on economic opportunities in renewable energy technology development and on job creation (Stevenson and Richardson 2003). Winskel talked about the emergence of multi-level governance which adds complexity to the system but also offers space for experimentation and different approaches to fostering low carbon innovation (Winskel 2007). Devolution opened up another level of policy making and discourses e.g. in Scotland were partly quite critical of UK wide policy around the RO and challenged major assumptions. Devolution thus opened up new policy arenas in which dominant discursive commitments of the central government were successfully re-framed which created pressure for policy change also on the national level.

Another institutional factor important for the way in which the Carbon Trust was designed is the way the British civil service is organised. Generally characteristic of the UK is a

[38] The ambition is for Scotland to become to marine energy what Denmark is to wind power (Winskel 2007).

"highly professionalized, non-partisan civil service with a low level of autonomy […] designed to avoid bureaucratic drift" (Saalfeld 2003: 620). The role of the civil service is to be one of 'neutral competence' "in which highly professional civil servants serve the party in power" (Saalfeld 2003: 638). The structure of the civil service changed substantially in the 1990s when a lot of the policy implementation was 'outsourced' to executive agencies and the civil service was to focus on the core needs of policy development and relations with Parliament. The main objective behind these changes was managerial efficiency (Saalfeld 2003). Public service agreements and management by objectives were new ideas implemented in the civil service. While the thrust of the reforms was to focus on policy development, the civil servants available for policy development shrank as four-fifths of the nearly 500,000 civil servants became employed in executive agencies and the overall number of civil servants was reduced drastically (Saalfeld 2003: 639). In addition, Helm has argued that because of the UK Governments' belief in the liberalisation discourse in which the setting-up of regulators was believed to be sufficient energy policy, the intelligence of civil service with regard to energy policy was diminished as there was no need for other policies (Helm 2002). This factor partly explains why private actors were so dominant in the creation of the storyline and the subsequent design of the Carbon Trust. DETR simply did not have the expertise or manpower to develop this policy programme on its own. The institutional reforms of the 1980s and 1990s thus led to a growing influence of external policy advice.

In terms of informal 'rules of the game' or standard operating procedures the described dominant discourse around 'free market' competition, market failures, and market-based approaches dominates the state actions in this policy field (see section 5.2). The policy approach followed can be described as outcome-driven rather then following a top-down strategic plan, as a senior civil servant from DBERR described vividly:

> "We want the market to deliver this. Therefore we set up lots of bodies which try to address these market failures. This is essentially what we are doing rather than that more interventionist approach which is taken by those European countries [referring to an earlier discussion of the Netherlands] in particular. Which all comes back to this obsession we have got about 'picking winners'. We do not pick winners and that's been drilled into every civil servant, the treasury. … We address market failures" (interview 10).

This discourse has been institutionalised in the norms of the civil servants and in executive agencies like Ofgem[39] and thus provides a constraint on new policy initiatives which go against this grain. As argued above, in the case of the development of the Climate Change Programme this preference for market mechanisms led to the CCL, and the idea that the market can deliver the transition to a low carbon economy influenced the policy choice in favour of a business-led Carbon Trust.

Generally, a "key international constraint on the British government is its membership in the EU" (Saalfeld 2003: 642). For the specific case analysed here the EU state aid rules have an important influence on how the state can support low carbon technologies and therefore what the Carbon Trust can do to fulfil its mission (interviews 2; 5; 8; 10; 17; 18; 21; 24; 26). According to interview evidence, the EU state aid rules shaped what the Carbon Trust would look like. A senior manager of the Carbon Trust who was in charge of developing its investment and innovation programme admitted:

> "I don't think what we came up with bore much resemblance with what was originally envisaged because of a number of reasons but primarily because the funders and those that scoped out the direction of the Carbon Trust had very little grasp of what public money could do and the constraints of state aid and government procurement rules. … The initial vision of it [the Carbon Trust] was not congruent of what a publicly funded body is allowed to do in terms of state aid" (interview 26).

This example clearly shows the limits of ideas: they can meet 'hard' institutionalised rules. The EU state aid rules have been described by interviewees as one of the key institutional constraints which limit the activities of the CT in a variety of ways:

- If the CT supports a device developer and patentable knowledge is created, the CT has to retain the IP which makes it less attractive for companies (interview 18);
- State aid rules make it difficult to fund demonstrators (interview 10);
- The CT as a whole needed EU state aid exemption; rules about maximum aid intensity: funding for R&D activities is usually 40% co-funding, only for Universities is 100% funding allowed (interview 2);
- The EU state aid rules are one of the reasons that the CT does not have a larger commercial investment activity as they require co-investing (interview 26);

[39] Ofgem has been criticised for having a very narrow view on consumer interests in low prices. However, recently the Government announced in its Low Carbon Transition Plan that it would change Ofgem's remit from protecting customers' interests to also include tackling climate change and security of supply as part of its duties.

- There can be no disproportionate benefit for companies out of cooperation with CT (interview 18);
- The CT has to be reactive, wait for companies to approach them instead of being able to proactively target companies (interview 1);
- The state aid rules need to be thought about in any decision the investment committee makes (interview 17).

These examples show how EU state aid rules shape the activities of the CT. However, in April 2008 the European Commission published a revision of the Community Guidelines on State Aid for Environmental Protection (2008/C 82/01) to "ensure better targeted aid, improved economic analysis and more effective procedures" (p. 5). This illustrates that the institutional context cannot be seen as stable but also changes over time.

Summary: The impact of the institutional context on the 'developing low carbon technology' storyline and the setting up of the CT

As already pointed out, institutions can have a constraining as well as enabling impact on discourses shaping new policy initiatives. In terms of constraining influences the EU state aid rules were clearly shaping the design of the CT. However, this should not be seen as an absolute constraint as there seems to have been some flexibility with regard to the interpretation of these rules. This provided room for actors discursively making a case about which state actions were permissible. Another strong constraint pointed out above concerns the informal norms such as the faith in competition and non-intervention in markets by civil servants and policy makers. These norms make additional policy instruments superfluous or shape them in ways which are in line with these commitments. Devolution meant a challenge for the 'developing low carbon technology' storyline by introducing the need for it to be accepted by the devolved administrations. The reforms of the civil service and its limited capabilities in energy policy issues contributed to the dominance of ACBE in the development of the policy programme.

In terms of the enabling influence of the institutional context the most important point to make is, despite devolution, was the existence of a strong central government which

enabled the new Labour Government in 1997 to come in and promote this policy change without much interference from the opposition or other 'veto players'. The devolution process also opened up discursive space for alternative storylines. Despite the adversarial party politics in the UK there seems to have been no substantial protest from the Conservative Party against this policy initiative. This is arguably due to the fact that the discourse coalition promoting the 'developing low carbon technology' storyline anchored the initiative mainly in familiar policy discourses supported by the former Conservative Government (competition, market incentives, business opportunities).

5.6 Change in policy practices and institutions?

After having analysed the emergence of the 'developing low carbon technology' storyline, this section analyses which impacts its emergence had on UK energy policy. While section 5.4 analysed the discourse structuration, the following section will analyse the discourse institutionalisation of the storyline by describing the main activities of the CT. The subsequent section will investigate to what extent this implementation is in line with the 'developing low carbon technology' storyline.

5.6.1 The setting up of the Carbon Trust

The main political change associated with this storyline was the setting up of the Carbon Trust. The sections above have already analysed the process of setting up the Carbon Trust, which was made possible by the emergence of the 'developing low carbon technology' storyline. This storyline was promoted by a coalition of civil servants from different ministries, ACBE, other sector interest groups, and green lobby organisations. The process led to the Carbon Trust being set up by DTI and DEFRA in April 2001. The idea that technology-specific innovation support is needed and that it is important to remove specific financial, technological, as well as institutional barriers that are hindering the wider deployment of low carbon technologies has been institutionalised in the Carbon Trust. In

line with the storyline its remit covers both improving energy efficiency and developing and deploying new low carbon technologies.

The CT's mission is to 'accelerate the move to a low carbon economy' (Carbon Trust 2007a). Its activities cover a broad spectrum and can be divided into five complementary business areas (see Figure 10): *Carbon Trust Insights* to inform businesses and policy makers about climate change and increase awareness, *Carbon Trust Solutions* to help companies to reduce their emissions, *Carbon Trust Innovations* to help develop low carbon technologies, *Carbon Trust Enterprises* to create new low carbon businesses using existing technologies and *Carbon Trust Investments* to finance the best ideas and business plans.

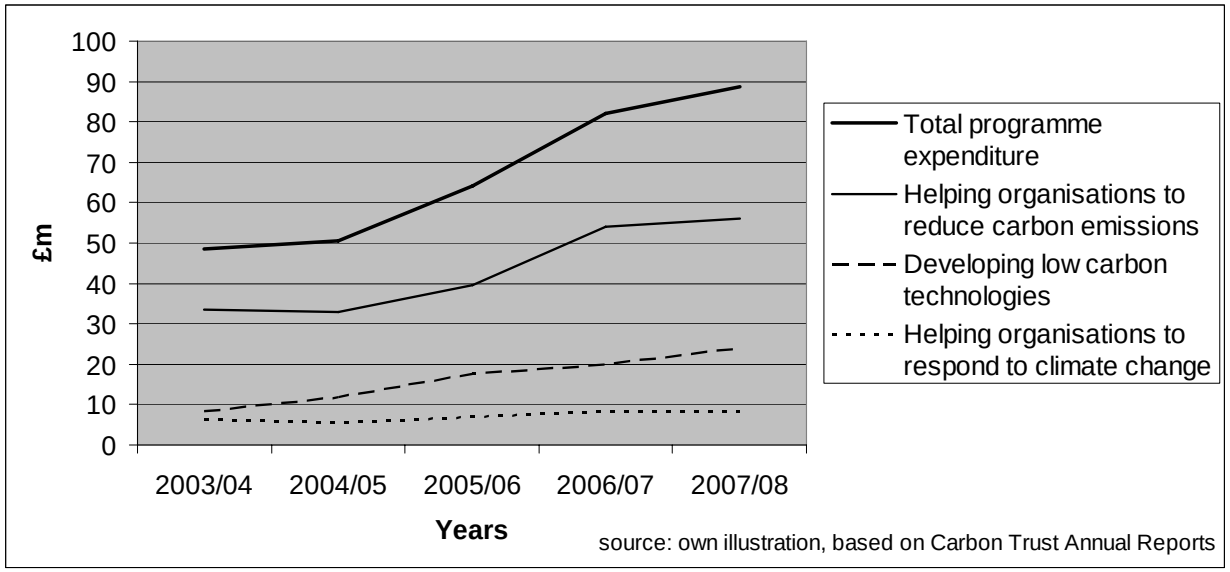
Figure 10: The Carbon Trust's five business areas

Source: Carbon Trust, unpublished presentation

The Carbon Trust is mainly financed by central government (Department for the Environment, Food and Rural Affairs, DEFRA; and the Department for Business, Enterprise and Regulatory Reform, DBERR), but the devolved administrations (Northern Ireland, Wales and Scotland) also contribute some funding. As of March 2007, the CT had

134 employees and received a total grant funding of £115.8 million for 2007/08 (Carbon Trust 2007c). Most of the programme expenditure is spent on helping organisations to reduce their emissions (Solutions), whereas about £20 million is spent on developing low carbon technologies. Spending on the *Insights* work has been roughly constant at around £9 million per year (see Figure 11).

Figure 11: The Carbon Trust's programme expenditure



(Source: based on the Carbon Trust's Annual reports; note: helping organisations to reduce carbon emissions (Solutions); developing low carbon technologies (includes: Innovations, Enterprises, Investments) and helping organisations to respond to climate change (Insights))

The Carbon Trust *Solutions* programme is trying to directly help companies to reduce their carbon emissions and is where the CT spends most of its resources. In 2006/07 the CT invested £54 million in such activity (see Figure 11). As part of its *Solutions* programme, the CT offers advice to companies and public institutions on how to save energy or increase energy efficiency (through information booklets, a website and a call centre), offers free energy audits for large companies, offers tax breaks for energy-efficient equipment (enhanced capital allowances) and gives interest-free loans to small and medium-sized companies to purchase energy-efficient equipment.

The CT supports the development of low carbon technologies through all stages of innovation from R&D to promoting deployment (IEA 2007: 168). As part of its

Innovations programme, the Carbon Trust funds RD&D projects in their *applied research* scheme. Through the applied research scheme, universities, local authorities or any business can receive up to £250,000 for research projects "that show genuine innovation, strong potential to reduce UK carbon emissions and a credible route to commercialisation" (Carbon Trust 2006a: 20).

The CT also runs an *incubator scheme* offering advice to new companies in commercialising their R&D and attracting commercial investment. Incubator companies receive flexible consultancy support of up to £60,000. So far, 40 companies have been supported with approximately £2 million in total. The companies which receive help are mostly start-ups or spin-offs from universities or industry, such as Oxford Catalysts, which received support through the CT–ANGLE incubator providing a market analysis, help with a long-term management plan and identifying potential partners (Carbon Trust 2007b). The focus is not so much on the technology as on building a suitable management team, identifying a target market and making the company 'investor-ready' (interview 17).

In addition, the CT runs *technology acceleration projects*, which are aimed at identifying regulatory, financial and technical barriers to the growth of technologies. This may include conducting trials and demonstration projects, carrying out engineering assessments and helping to accelerate technologies 'down the cost curve' (Carbon Trust 2006a). The CT typically helps projects with technical, infrastructure and financial support (Carbon Trust 2005). The CT currently has five technology acceleration projects with a total budget of £25 million over five years. These are biomass heating, small-scale combined heat and power, advanced metering, low carbon buildings and marine energy. The aim is to accelerate the development of these technologies on a commercial scale (Carbon Trust 2007a: 8). The projects are selected on the basis of two questions: "How much carbon can the proposed technology save over time?" and "How much difference can the Carbon Trust make to the success of the technology?" (Carbon Trust 2005: 1).

A senior manager at the Carbon Trust sums it up thus: "We have a proven set of interventions in our *Innovations* business which have been very very successful" (interview

23). This comment is interesting as it highlights how much the CT thinking is based on the idea of market failures and 'interventions' to correct for these.

To complement the other innovation programmes, the CT also co-invests in new low carbon technologies directly. With its *Investments* programme the CT aims to address a lack of private finance for small-scale investments between £250,000 and a few million pounds (Carbon Trust 2007a: 12). In 2005/06 the CT invested £2.1 million in two new companies and made follow-on investments in two other companies. The CT hopes that "acceptable investment returns should be generated from the portfolio over time" (Carbon Trust 2006a: 46). Overall, the first six equity investments totalled £6.7 million in technologies such as fuel cells and offshore wave generation. It is pointed out that this investment has also helped to leverage further private sector investment worth £67 million (Carbon Trust 2007a: 12). The Carbon Trust prides itself on a good reputation in the clean technology investment community and through its co-financing of investment often functions as 'the last pound on the table that makes the deal work' (interview 12). The support of the Carbon Trust lends credibility and reputation to technology developers and increases their chance of attracting investors (interviews 16; 18). This is also confirmed by companies which received incubator support from the Carbon Trust (Carbon Trust 2007b).

The Carbon Trust has also expanded its role in commercialising low carbon ideas based on proven technologies by establishing Carbon Trust *Enterprises* Ltd. The first company it set up was a heat energy networks company, which will "identify, develop, finance and operate a series of heat energy networks across the UK" (Carbon Trust 2006a: 22) to transfer industrial waste heat to heat consumers in the nearby area. The company, called 'Connective Energy', was established in July 2006 in cooperation with Doosan Babcock Energy and the Triodos Renewable Energy Fund (Carbon Trust 2007a: 11). It aims to construct ten heat pipelines for the utilisation of waste heat over the next three years, targeting a potential £1 billion UK market. The Carbon Trust also set up a company developing renewable energy projects on public sector land called 'Partnership for Renewables'. The Carbon Trust invested £2.5 million in its Enterprises programme in 2006/07 (Carbon Trust 2007c: 19). Again the *Enterprises* work was started because "we

knew this is another market failure … we knew there were a lot of near market technologies that weren't really new technologies but nobody was making these things happen" (interview 11).

The aim of the Carbon Trust's *Insights* programme is to inform businesses and policy makers about the importance of reducing carbon emissions. Through independent and high-quality reports on, for example, the impacts of the EU ETS on competitiveness or suitable policy frameworks to support renewables, the CT hopes to contribute to policy thinking in these areas. Through its current work, such as on the carbon footprints of production chains, the Carbon Trust also hopes to inform business about the possibilities for supply chain management and help in the creation of credible methodologies for carbon labelling. Through its *Insights* work the Carbon Trust "has built up a strong brand image and raised awareness in the business community and the public sector of the need to reduce carbon dioxide emissions" (NAO 2007b: 6).

This section has provided a brief overview of the CT's different business areas. In the following section it will be analysed to what extent the Carbon Trust's activities have been shaped by the storyline.

5.6.2 The influence of the storyline on practices of the Carbon Trust

One of the key aspects of the storyline was that an organisation to support the development and deployment of low carbon technologies needed to be set up independently from government and led by business. This idea was implemented in the CT and has had a major impact on its organisational routines as compared to a public agency. In particular it translated into the Carbon Trust viewing itself as a politically neutral body conducting objective analysis, it enabled a business strategy based on brand capital, and it allowed the CT to develop a variety of innovative forms of support for low carbon innovation.

Due to the strong commitment of the storyline for the CT to be independent from government and free from political interference, the Carbon Trust was set up as a company limited by guarantee rather than as a non-departmental public body. It also translated into a

self-understanding of the Trust as a non-political, independent body. It is difficult to say whether this commitment is part of a conscious strategy or whether it simply reflects the background of its staff (interview 20). Part of this commitment is the idea that the "CT wants to persuade government to take right decisions, not to lobby" (interview 7). The CT is committed to providing the Government with

> "fact-based, objective analysis of what the implications of different types of policies might be, on how much carbon they deliver, the cost effectiveness, impact on the economy and businesses. … We are not trying to lobby" (interview 23).

Its independence from government makes it possible for the CT to challenge government thinking on low carbon policy issues (interview 6). One example of this is the report on policy frameworks to support renewable energy technologies which argued in favour of technology-specific feed-in tariffs (Carbon Trust 2006b) – an anathema for the Government at the time.

The fact that the CT was set up as a business-led endeavour has also led to strategies based around building a brand:

> "A government body wouldn't normally worry building a brand…We can do things because we have brand capital. So people want to be associated with us ... And in order to get there you have to invest what is relatively large amounts of money that the public sector couldn't do. But we are doing it because we understand, coming from business, what the purpose of creating a brand is in a way that if you are in the public sector [you] would never understand. And the brand is important and is carefully managed. We have very high recognition and very high favourability" (interview 5).

This quote illustrates the difference it has made to set up the CT as a business-led body. Several interviewees confirm that the CT has been "incredibly successful" (interview 15) in building a brand and that its brand awareness in the business community is very high (interviews 1; 10; 11; 15). The results of a survey by a SME business organisation amongst its members showed that 80% of businesses knew of the Carbon Trust (BCC 2006). The effect of that brand recognition is that it encourages companies to understand that carbon emissions are a "key issue for businesses, something that business needs to respond to and there is real money in it" (interview 11). The quality of the brand also helps the CT to lever significant private financial resources as, for example, venture capital investors see the

CT's judgement on a company as a confidence builder which makes it more likely that they will invest (interviews 4; 5; 17).

Most importantly, the independence from government enabled the CT to develop innovative forms of innovation support which a government agency could not have. If the CT had been established as a public body, "the modes of funding would not have been as varied and probably wouldn't have been as successful" (interview 24). In particular the CT's *Investments* or *Enterprises* activities would not be possible for government departments or public agencies because of public spending rules (interviews 4; 24). This allows the CT to pick winners more aggressively than would be possible for government (interview 4). One of the achievements of the CT is seen as having invented "those different intervention models, R&D, accelerators, incubators" (interview 23). It has been argued that the "Carbon Trust's status as an independent company allows for novel intervention models which bring significant benefits:

- Flexible, business-focussed and market-oriented approach;
- Ability to leverage private sector funds;
- Proven project selection based on CO_2 and economic potential;
- Ability to prioritise, to 'pick winners' and take risks;
- End-to-end support for all project stages;
- Innovative funding approaches including equity investment" (Shortt and Mallaburn 2007).

The key idea of the 'developing low carbon technology' storyline of having an independent business organisation to support the development and deployment of low carbon technology was institutionalised in the Carbon Trust and led to practices in line with the storyline. This status allowed the Carbon Trust to develop a variety of funding modes which would have not been possible for a public agency. It also led to an organisational strategy based on developing 'brand capital'.

Another central idea of the 'developing low carbon technologies' storyline was that there was a 'valley of death'/'innovation gap' in bringing low carbon technologies to market, so support for moving low carbon technologies along the innovation chain was necessary. Thinking about innovation support in terms of pushing innovations from the R&D stages through to market has been associated with the linear model of innovation which sees

innovation processes as a pipeline. This thinking is dominant within the Carbon Trust as for example a quote from its CEO Tom Delay illustrates:

> "Innovation is essential to achieving our goal of reducing long term emissions: as we move closer to full deployment of existing technologies, we need an ever stronger pipeline to maintain progress. In turn, this pipeline could provide major export opportunities for the UK" (Carbon Trust 2008: 5).

Similarly, a senior manager in charge of one of the technology accelerators explains that

> "The accelerator concept is all about having some intervention in a technology innovation chain that can really progress it through that area where sometimes good ideas can get lost and good technologies can get lost and also push it through the areas where there is perhaps regulatory hurdles to go through and our intervention can help that" (interview 18).

A senior academic confirmed that the innovation chain concept for the CT

> "is a way to thinking about how it develops its own activities because it is not claiming any particular part of that innovation chain for itself because its activities cover a range right from carbon vision, which was really basic research, all the way through to almost the kind of venture capital activity they have, which is right at the other end. So I think they are using it as a way to structure their own thinking about what they do" (interview 24).

Michael Grubb, the chief economist of the CT, acknowledges that innovation is not a linear process but also promotes the idea of an innovation chain and policies to 'narrow the innovation gap' (Grubb 2005). He sees the Carbon Trust's programmes as part of this effort. Also, policy makers see it as the role of the CT to invest in early-stage technologies and continue to support the ones "where you achieve moving the technology through the pipeline towards commercialisation" (interview 12).

These quotes seem to suggest that the ideas of the innovation chain, the innovation pipeline and the presumed existence of 'innovation gaps' or 'valleys of death' from the 'developing low carbon technology' storyline have been institutionalised in the organisational routines of the Carbon Trust and shape their innovation programmes. However, this has been disputed by interviewees: a former senior manager of the CT argues that although an innovation chain does not exist ("The only people who believe in the innovation chain are

bureaucrats who have never done any innovation"), the idea of an innovation chain is really powerful in convincing policy makers to fund innovation support but that none of the CT's programmes actually relied on the existence of an innovation chain (interview 26). Another interviewee points to the fact that people in charge of the innovation support activities know that innovation is not a linear process but find that it is difficult to picture non-linear processes so they use glossy pictures that show the innovation chain, which come from the chief economist rather than from the people responsible for the innovation programme (interview 24).

This uncovers an instance in which the problem understanding of the storyline ('innovation gap') did not manifest itself in Carbon Trust practices, but is used by the CT management in their public rhetoric. Because policy makers were convinced of the existence of these gaps by the discourse coalition in the process of setting up the Carbon Trust, its management continues to use this language without itself believing in it. More recently the idea of an innovation chain has also been used strategically by the Carbon Trust to distinguish its activities from other organisations (such as the Technology Strategy Board, the Energy Technologies Institute or the Environmental Transformation Fund). The role of the CT compared to these other initiatives is often explained by referring to its particular role in reference to the innovation chain. The innovation chain concept is thus used as a differentiator. As a senior manager from the CT explains: "we have a very specific role within the innovation chain" (interview 23). The CT is claimed to be a unique organisation in that it operates across the whole innovation chain from early-stage work with universities, open call applied research to deployment and commercialisation (interviews 12; 22) and for always taking a business view (interview 5). Working across the whole innovation chain is seen as a distinct advantage of the CT compared to other initiatives because it enables the CT to learn from its early-stage work and apply this knowledge to initiatives further down the chain (interview 17). Here the storyline is used rather instrumentally to justify the existence of the CT to policy makers and vis-à-vis other quangos.

The institutionalisation of the 'developing low carbon technology' storyline in the Carbon Trust, with its acknowledgement of the necessity of differentiated support for technologies at different stages of development, can be interpreted as quite a radical change with respect

to the dominant 'free market' discourse and its commitment to technology-neutral policy interventions, which precluded any kind of industrial policy strategy. As pointed out earlier, there was an aversion to having an industrial policy strategy in the UK (interviews 4; 5; 21). Linking energy policy and industrial strategy has usually been rejected in policy discussions in favour of a *laissez faire* approach (Watson 2009). However, the Carbon Trust is seen as a small step towards an industrial policy by several interviewees (interviews 5; 12; 20; 21). The CT itself sees its role as partly being to develop low carbon industries:

> "Carbon Trust Innovations helps to develop new low carbon technologies. If we get this right the UK will benefit enormously. We can both address climate change and develop global industries. There is already the potential for the UK to be a world leader in several technologies or sectors. We are building that leadership — in partnership with universities and businesses — and creating vibrant new sectors" (Carbon Trust 2007b: 1).

The institutionalisation of the 'developing low carbon technology' storyline in the Carbon Trust de-facto introduced some element of an industrial policy into UK energy policy.

It is argued that the 'developing low carbon technology' storyline has contributed to a wider change in government thinking and its informal rules of the dominant discourse about the preference for non-intervention in markets. Compared to the late 1990s when the storyline was emerging, a more active technology policy is now more acceptable and more institutions designed to directly support low carbon technologies have been set up, such as the Environmental Transformation Fund, the Energy Technologies Institute and the Technology Strategy Board. DBERR is offering direct support to build a full-scale CSS demonstration plant. The Low Carbon Buildings programme offers grants for the diffusion of low carbon micro-generation technologies. Most recently the Government even published a Low Carbon Industrial Strategy (BIS and DECC 2009).

However, the larger context of this change needs to be considered. Greater support for stronger policy action to develop and deploy low carbon technologies (incl. nuclear) was partly due to the disappointing policy outcomes. The objectives of the renewables obligation (10.4% share until 2010/11) looked increasingly unlikely to be met as until 2005

only 4% of renewables had been achieved. Rutledge speaks of “an extremely feeble expansion of renewables and CHP” (Rutledge 2007: 916). Several influential reports suggested to the UK government to play a more active role in developing and deploying low carbon technologies (Stern 2006a; IEA 2007). Also academics argued for more government leadership in research, development, demonstration and deployment of energy technologies (see e.g. Anderson and Gross 2000; Foxon, Pearson et al. 2005; Sauter and Watson 2007). In contrast with the UK, other countries such as Germany or Spain were much more successful in deploying renewable energy technologies and developing a wind turbine manufacturing industry (notable Germany, the US and Denmark). In addition, the credit crunch and the following economic crisis made calls for a green industrial revolution, including the promotion of energy efficiency and low carbon technologies, much louder (see e.g. Monbiot 2008; Bowen, Fankhauser et al. 2009; Stern 2009). The advocacy of the Carbon Trust for more technology specific-policies is thus just one out of several factors which contributed to this wider policy change. However, without an established, credible storyline to support this policy change the government would have faced more opposition to this more active policy stance.

5.7 Conclusions regarding the UK Carbon Trust case study

The emergence of the Carbon Trust was initially a by-product of Labour’s commitment to the introduction of a revenue-neutral climate change levy, in line with the dominant discourse around ‘free market plus taxation’. A storyline of having an independent, business-led organisation to promote low carbon technology was strategically promoted by a number of business representatives to increase their involvement in the recycling of some of the receipts from the CCL and to avoid negative impacts on competitiveness. This tied in with the Labour Government’s stronger commitment to energy efficiency, which formed a strong coalition between civil servants and business actors promoting a ‘developing low carbon technology’ storyline.

The institutionalisation of the ‘developing low carbon technology’ storyline took place through establishing a new organisation, the Carbon Trust. Central ideas of the storyline, around the need for its independence, and business-led, business-focussed support for energy efficiency and low carbon technology development, were institutionalised. The analysis highlighted the importance of the interplay between ideas and institutional factors in explaining the emergence and shape of the ‘developing low carbon technology’ storyline and its institutionalisation in the Carbon Trust.

Many of the central aspects of the ‘developing low carbon technology’ storyline are in line with the dominant ‘free markets plus taxation’ discourse and have thus enabled cognitive recognition for the need for and normative acceptance of an organisation like the Carbon Trust. The ‘closeness’ of the storyline with the existing dominant discourse explains the absence of major opposition to these policy ideas. Because of the close link to the dominant discourse around the importance of market solutions to tackle climate change, the CT focuses its activities on technological innovations and the commercialisation (‘route to market’) of these technologies. The institutionalisation of the storyline in the Carbon Trust, for example, faced significant institutional barriers such as EU state aid rules.

The establishment of the Carbon Trust provided a first crack in the dominant discourse which argued against technology-specific instruments and ‘picking winners’. The discourse coalition behind the ‘developing low carbon technology’ storyline used the drive of the new Labour Government for introducing a climate change levy to complement the levy with a more active low carbon technology development and deployment policy. Since being set up in 2001 the Carbon Trust has seen a substantial growth in its funding and has developed a variety of innovative vehicles to fulfil its mission, which are seen to be successful in achieving its carbon emission reductions targets. Based on this storyline the Carbon Trust has established itself as an actor in favour of a technology-specific approach and has, through a number of diverse initiatives, influenced wider policy developments (e.g. *Insights* work, experts in select committees, etc.) It has thus proactively widened its spectrum of activities in line with the perceived needs of the challenge and has therefore transcended its role as a ‘simple’ delivery body. The storyline has contributed, among other factors

discussed above, to the increased acceptability of technology-specific policy instruments and the desirability of industrial policy. A number of new policy initiatives have been set up along these lines. The CT has been challenged by the growth of other policy initiatives in this area and is struggling to differentiate itself from and legitimise itself vis-à-vis these initiatives.

Despite highlighting certain discursive factors in explaining the emergence of the Carbon Trust, the case study also demonstrated several instances of 'politics as usual' that were of importance in this policy formulation and implementation process. The change to a Labour government gave a boost to renewables and energy efficiency policy. The policy formulation process, and in particular the decision as to whether to establish a new organisation or rely on the EST to recycle some of the receipts, was subject to lobbying by incumbent business actors in whose interest it was to be involved in the distribution of the CCL receipts. In these cases discourses were used strategically to fulfil existing interests.

6 The discursive politics of governing ‘system innovations’ towards sustainable electricity systems: Cross-case analysis

The purpose of this chapter is to look across the two case studies presented in chapters 4 and 5 to reflect on how they inform more general, theoretically formulated explanations of the politics of initiatives aimed at ‘system innovation’. Case studies can contribute to theory testing or development, for example by suggesting new hypotheses or causal mechanisms, by strengthening or reducing support for a theory and by narrowing or extending the scope of a theory (George and Bennett 2005: 109).

The process tracing method applied to the cases was aimed at uncovering mechanisms which explain the observed policy and institutional changes. In this chapter the extent to which discursive institutionalism can explain the policy changes outlined in the case study chapters (6.1), existing explanations for the case of the energy transition (in section 6.2) as well as alternative, interest-based explanations (in section 6.3), will be discussed. Section 6.4 clarifies the role of discourses, institutions and interests in policy change. Section 6.5 points to the limits of the analysis.

6.1 Discursive mechanisms causing policy and institutional change

The process tracing method applied in this thesis was aimed at uncovering mechanisms which explain the observed policy and institutional changes. So, which causal mechanisms of policy and institutional change have been hypothesised? The following section discusses the mechanisms that Hajer and Schmidt have highlighted in their work to see whether these can help to explain the emergence and shape of the two new policy initiatives analysed in the two case studies elaborated above.

Hajer points to a variety of ways in which discourses influence processes of policy change. These include 'new storylines', 'disjunction markers', 'symbolic politics', 'the need for sensory experience', 'the discursive creation of macro actors', 'the social construction of ignorance', 'black boxing', 'positioning and mutual functionalisation', as well as 'structured ways of arguing' (Hajer 1995: 268-275). Based on evidence from the contributions in their edited book, Radaelli and Schmidt also highlight a number of mechanisms through which discourses can contribute to policy change. These include: 'providing actors with new ways of conceiving of a policy', 'rhetorical entrapment', 'coordinating policy agreements' (Radaelli and Schmidt 2005: 196)[40]. The mechanisms which have been found to play a role in the analysis of the case studies will be discussed below.

It is important to be clear that these mechanisms are not meant to be exclusive, but rather that different mechanisms can play a role in policy processes simultaneously. They are merely distinguished here for analytical purposes in order to be able to assess the full spectrum of influence that discourses can have on policy making.

6.1.1 'New storyline transforming interests'

Recalling the theory chapter, Hajer's general claim is that new discourses can re-order existing understandings of policy problems, which can lead actors to reconceptualise their interests (Hajer 1995: 261). Similarly, Schmidt argues that new discourses can cause policy change by 'providing actors with new ways of conceiving of a policy', which leads to a reconceptualisation of interests and thus makes policy and institutional change possible (Schmidt and Radaelli 2004: 188). According to Schmidt new storylines need to be cognitively convincing as well as normatively appealing (Schmidt 2001). Whether or not a

[40] They also mention 'legitimating policy through public communication' as a factor. However, in line with the framework of this thesis, the coordinative dimension of discourses covers this aspect. Legitimating policy through public communication will thus be part of analysing the different mechanisms, rather then being a mechanism in its own right. 'Providing actors with new ways of conceiving of a policy' is equivalent to Hajer's 'new storyline transforming interests' and will thus be taken as one mechanism. 'Coordinating policy agreement' is equivalent to what Hajer described as 'positioning and mutual functionalisation' and will therefore be dealt with in this section.

discourse is convincing depends on how the discourse is constructed in the coordinative sphere and how it is conveyed in the communicative sphere (Radaelli and Schmidt 2005: 186). Hajer also talks about the importance of the social resonance of eco-modernist principles (Hajer 1995: 262). A new storyline which succeeds in redefining interests and leads to a change in policies and institutions is considered transformative. Schmidt argues, for instance, that Thatcher's neoliberal discourse was transformative, because it successfully justified her policy programme. Its success rested not only on its cognitive and normative merits, but was also attributable to the fact that "it was based on a reconceptualization of middle-class interests, along with policies that reinforced such interests. However good the discourse, after all, interest also necessarily plays a role" (Schmidt 2001: 261).

In the Dutch case study the 'transitions' storyline has been shown to be transformative. The initial impulse for a policy change stemmed from the recognition of VROM policy makers that existing policy had failed to solve persistent environmental problems; a notion produced through the emergence of the new storyline, which re-framed the way these problems were seen as well as suggesting a possible alternative policy approach: transition management. As argued in chapter 4, this process also partly transformed the interests of EZ, which became much more interested in long-term change as a means to complement their focus on liberalisation and short-term efficiency in the energy sector[41]. The Economics Ministry, usually opposed to seemingly over-demanding environmental policies, saw the approach as offering new steering possibilities in times of liberalisation. Transitions offered a means of paying more attention to the long-term future of the energy system. The 'transitions' storyline transformed EZ's interests and therefore led to TM being accepted into the Fourth NEPP as well as EZ appointing itself as the transition manager of the Energy Transition. Without the transformation of EZ's understanding of the Department's interests, this policy change is unlikely to have happened. The power of this mechanism rests on the ability of new ideas to shape actors' perception of their self-interests.

[41] However, it is important to point out that long-term goals complemented, but did not replace, EZ's existing goals such as liberalisation to increase economic efficiency, which caused problems of policy incoherence in the implementation of the Energy Transition, as argued elsewhere (Kern and Howlett forthcoming, 2009).

In the UK case study, it was shown in the empirical chapter that the 'developing low carbon technology' storyline was more in line with the existing dominant discourse (and interests) and did not transform actors' interests. This is not surprising as Radaelli and Schmidt point out that only relatively rarely can discourses be shown to have shaped the interests of actors (2005: 189).

6.1.2 'Positioning and mutual functionalisation'

According to Hajer, actors do not have fixed roles, but are constantly positioned in discursive exchanges (Hajer 1995: 272). Storylines can have a positioning effect, for example by blaming certain actors for a problem and seeing others as being able to solve it: "[t]hrough story-lines actors can be positioned as victims of pollution, as problem solvers, as perpetrators, as top scientists, or as scaremongers" (Hajer 1995: 65). He claims that it is often possible to identify actors who strategically sustain storylines with different reasons in mind, often based on partially different understandings of the storyline:

> "Actors may accept certain positionings or adhere to certain story-lines because they see it as a functional moment in their overall strategy or general perspective. In the mean time positionings as well as definitions of problems and solutions are accepted and reproduced" (Hajer 1995: 273).

Hajer mentions examples in which actors uphold central eco-modernist storylines such as the suggestion that protecting the environment is a positive-sum game, that environment and growth can go hand in hand, and the idea that environmental investment creates jobs (Hajer 1995). Actors establish discursive links to another desirable political goal in order to facilitate agreement and subsequent action. Similarly, Schmidt points out that while coherence may sometimes make for a 'good' discourse, ambiguity sometimes makes for discursive success (Radaelli and Schmidt 2005: 185; Schmidt 2006a: 253) [42]. The malleability of the EU discourse on anti-discrimination policy, for instance, allowed domestic policy makers to fit EU policy into different domestic paradigms. It also allowed

[42] However, it is unclear under which conditions coherence or ambiguity is helpful. Schmidt and Radaelli point out that it is also unclear how much flexibility is too much, rendering the storyline meaningless (Schmidt and Radaelli 2004: 202). The theory does not as yet provide a specific hypothesis or scope conditions that can be tested in this regard.

policy makers to make “ideational and policy linkages that re-defined the problems and made them more amenable to collective action” (Radaelli and Schmidt 2005: 186). Actors can thus re-interpret a policy idea in a way which resonates with existing norms or policies.

In the case of acid rain, Hajer argues that the discourse coalition “gained influence because many different actors, including industrialists and environmentalists, could employ the new cognitive frame starting from different premises” (Hajer 1995: 251). Both Hajer and Schmidt point out that the ambivalence of a storyline can sometimes help to drive policy change because its interpretive flexibility can be used by different actors in variable ways, which aids coalition building and linking with established norms or interests.

In the Dutch case study this mechanism can be observed when EZ connected the ‘transitions’ storyline with their liberalisation and innovation agenda as well as their commitment to ‘green business opportunities’, which fitted their interests and made the storyline more acceptable within EZ. This positioning of EZ enabled the ‘transitions’ storyline to enter NEPP 4. As argued in chapter 4, the interpretative flexibility also helped bring about the policy change. When transition management was adopted by policy makers as a new policy approach, the concepts had not yet been developed in any depth but were “vague enough to be inspiring” (interview 7). In line with existing polder model practices, the interactive policy making and stakeholder involvement aspects of the storyline were highlighted whereas the potentially threatening commitment to structural change was sidelined.

In the UK case the discourse coalition around the ‘developing low carbon technologies’ storyline skilfully combined environmental considerations with business opportunities (win-win) as well as helping business to improve its energy efficiency to become more competitive, which led to actors not normally interested in environmental agendas supporting the storyline (Treasury, DTI, business). As argued in chapter 5, the storyline could be linked with a variety of departmental interests as well as business interest in the recycling of CCL revenue and therefore enabled the policy change.

6.1.3 'Need for sensory experience'

The 'need for sensory experience' is meant by Hajer in a wide sense including more than policy makers' excursions to see trees dying as a result of acid rain, for he also stressed the role of meetings and excursions in processes of persuasion such as meetings with research groups, attending symposia or expert meetings:

> "these practices are known not to be the most effective way of mediating knowledge but can nevertheless be identified as an essential moment in the process of proliferation and utilization of knowledge and, eventually, policy change" (Hajer 1995: 271).

This mechanism highlights the socio-cognitive aspects of political change. Hajer includes face-to-face contact with experts as part of this mechanism, which is believed to generate credibility and trust and is therefore key to persuasion (Hajer 1995: 271).

In both cases such processes of close face-to-face interaction between policy makers and experts played a key role in developing the new storylines as well as creating support for them. In the Dutch case a lot of face-to-face interaction between policy makers and ICIS-MERIT researchers fostered trust and credibility. Rather than just delivering a report, the 'transition' storyline was created jointly through a highly interactive process. Researchers used not only evidence and rhetoric to convince policy makers but even a play, a fairy tale and paintings that depicted the main concepts in order to persuade policy makers of their ideas (see 4.4). This intense cooperation was enabled by the open civil service culture in the Netherlands and was key to persuading policy makers about the 'transitions' storyline and co-developing the transition management concepts.

In the UK case too, a lot of personal interaction amongst the key participants took place during the development of the 'developing low carbon technology' storyline. As outlined in chapter 5, it was in particular the close cooperation between civil servants and members of ACBE (including the secondment of ACBE people into government to prepare the CT) that fostered trust and helped facilitate thinking along similar lines. A civil servant working on the development of the Carbon Trust policy initiative described the interaction with a key

ACBE proponent of the CT as a “meeting of minds” (interview 7). This trust and cognitive resonance was the cement for the discourse coalition which enabled it to jointly argue in favour of the Carbon Trust idea.

6.1.4 ‘Structured ways of arguing’

Hajer has proposed that policy domains have historically specific ways of arguing: “These discursive formats add credibility to the case that is being argued” (Hajer 1995: 273). He suggests that actors initially tend to follow these formats because they are well respected, but they can also introduce new problems in unconventional ways. However, as this is more difficult, the accepted formats are commonly followed initially.

In the Dutch case study the ‘transitions’ storyline relied partially on the familiar ‘market failure’ argument which is central to legitimising policy action in energy policy, as argued in section 4.2. However, the dominant discourse in energy policy nevertheless included environmental concerns as a central point, as well as an active role for the state, which the ‘transitions’ storyline could build on. The language around transition ‘arenas’ spoke to the polder model tradition. While this framing of the challenge resonated with ‘structured ways of arguing’ and therefore added credibility to the discourse coalition, it also limited the scope for more radical institutional change: to argue for the setting-up of stakeholder arenas in the context of the Netherlands guarantees almost full social support, but it underplayed other elements of the transition management toolkit such as putting the regime under pressure.

In the UK case study one of the most powerful constructs in the sense of a historically specific way of arguing a case was the ‘market failure’ argument, which is central to legitimising any policy action (as argued in section 5.2). This argument was used to establish the need for an organisation to foster low carbon technologies. So in both cases, it can be seen that using ‘structured ways of arguing’ added credibility to the emerging storylines and therefore helped them to become accepted. However, in both cases this framing of the storylines made it difficult for the discourse coalition to argue for radical

institutional change. The framing of the ‘developing low carbon technologies’ storyline, for example, explicitly situated business action as central to a transition. As the problem was framed in terms of a ‘market failure’, it followed that it could also be overcome by the market given the right incentives provided by the Carbon Trust.

This mechanism can therefore undermine as well as enable policy change: it makes change in line with historically specific ‘structured ways of arguing’ easier, while it obstructs policy ideas that are not in line with accepted formats. Historically structured ways of arguing can thus be understood as part of the institutional context in a policy domain.

6.1.5 ‘Black boxing’

‘Black boxing’ is described by Hajer as “perhaps the most fundamental of discursive mechanisms. Making things appear as fixed, natural, or essential is the most effective way of steering away latently opposing forces” (Hajer 1995: 272). As knowledge is always incomplete, uncertain or not agreed on, ‘black boxing’ is a way of putting issues beyond doubt.

This mechanism can be observed in the UK case, in which the claim that the market is superior in ‘picking winners’ whereas government is bad at picking ‘winners’, and the claim that generally ‘markets deliver’ outcomes, is part of the dominant discourse and has been ‘black boxed’. The ‘developing low carbon technologies’ storyline did not attempt to challenge this ‘black box’, but endorsed this understanding. The discourse coalition, however, added that technology-specific support is necessary for a transition to occur and should be provided by an independent organisation rather than the government. By pushing the choice of which technologies to support into the non-political realm, it enabled policy change without challenging the ‘black box’.

Instances of ‘black boxing’ can also be detected in the Dutch case study. Most notably, the notion of the need for a transition itself was ‘black boxed’ during the emergence of the ‘transitions’ storyline. For example, while the ICIS MERIT report emphasised the

importance of 'system innovations' as well as upgrading existing systems (as argued in section 4.4.1.1), this latter part was neglected in the subsequent coordinative and communicative discursive interactions. Consequently, there was no internal or public discussion about when a transition is necessary or when the optimisation of existing systems might be a suitable policy strategy. By making the fact that a transition is required appear to be a given, latently opposing forces, who might otherwise have argued that structural, long-term change is unnecessary and that an optimising strategy might be sufficient to solve the problems in the energy system, are silenced.

Furthermore, this mechanism can play a dual role: in 'black boxes' institutionalised storylines can "themselves become a political reality in their own right and then stand in the way of more reflexive institutional change" (Hajer 1995: 269). Alternatively, actors can succeed in 'black boxing' some of the claims of an emerging storyline, which helps to reduce opposition to policy change in line with such claims.

6.1.6 'The discursive creation of macro actors'

An important mechanism that can be used to prevent the development and use of policy-relevant knowledge, according to Hajer, is the creation of so-called 'macro actors'. These actors are perceived as being "solely responsible for passing judgement on the true state of affairs" (Hajer 1995: 271). In this way a sub-political realm is created in which knowledge or policy recommendations cannot be questioned. In Hajer's study of the acid rain debate in the UK the Royal Society was found to be discursively constructed as a macro actor countering influence from other policy-relevant knowledge, such as that produced by environmental scientists, and preventing it from entering into the discussions. As the Labour Government considered advice from business actors to be more important than advice from academics or experts (Helm 2003), business actors such as Lord Marshall or ACBE played a role as macro actors in the discursive struggles around the climate change programme and the Carbon Trust[43]. The Government followed their considerations and

[43] This resonates with the findings of Darkin, who claims that Labour's approach to environmental issues "consistently highlighted the role of business and the importance of the business response to the environment

judgement and frequently referred to their advice, which suggests that they can be seen as 'macro actors'. This mechanism leads to a powerful position for the macro actor while other actors find it hard to challenge the judgement of the macro actor, meaning that their influence on policy making will be minimal.

In the Dutch case, the actor usually charged with passing judgement on the true state of environmental affairs, which for example monitors carbon emissions and produces emission projections for VROM, is RIVM – the Netherlands Institute for Public Health and the Environment. RIVM would be the most likely candidate to be seen as a macro actor, but it did not provide a long-term outlook, nor did it engage in the debate about how to solve persistent environmental problems. One of the researchers promoting the transition ideas introduced RIVM's board of directors to these ideas at the beginning of the 1990s but "there was no interest at all" (interview 17). Other advisory councils (SER, VROM council) played a role in the discursive developments but none of these actors seemed to be able to establish itself as a macro actor. It is worth noting that in Hajer's study of the acid rain storyline he could not detect any macro actor playing an important role. A possible explanation for this is that this phenomenon is generally unlikely to occur in consensus-oriented cultures.

6.1.7 'Looking for new ideas from outside'

In both cases, a mechanism which has not yet been described in the discursive institutionalism literature can also be seen to have played a role. This can be described as 'looking for new ideas from the outside'. The policy learning literature has pointed to policy makers' dissatisfaction with the status quo as a stimulus for looking for lessons from elsewhere to dissipate the dissatisfaction (Rose 1991). Uncertainty, negative effects of current policy programmes, changes in values, as well as new ideas that raise aspirations about what is possible, can all create dissatisfaction. Discourses can contribute to creating dissatisfaction by providing alternative framings and new policy ideas. Policy makers may

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challenge" (Darkin 2006: 258). According to the 'New Labour' framing, policies on the environment were to be combined with economic and social progress.

also actively search for new ideas because they want to ‘score a point’ by championing new initiatives. Politicians are argued to enjoy coming up with new policy initiatives as it looks good on their CV and because they ‘need to be seen to be doing something’ once a problem has attracted attention. This mechanism again shows how policy decisions are based on perceived ‘necessities’ rather than ‘truth’.

In the Dutch case the team of civil servants in charge of preparing NEPP 4 explicitly looked for new ideas from outside because of the growing dissatisfaction with NEPP 3 (interview 7), which was partly amplified by the ‘transitions’ discourse coalition by emphasising the myopia of existing policies and suggesting alternatives (Rotmans, Kemp et al. 2001a). The ‘transitions’ storyline emphasised that markets and market-based instruments on their own would not lead to the desired results, thereby opening up space for ideas for other policy initiatives, which enabled the Energy Transition project.

Also in the UK case several interviewees pointed to this ‘need’ to invent something new (see for example interviews 5; 7; 10; 14) which tied in with the ‘shift in gear’ (interview 3) of the Labour Government with regard to climate change and energy efficiency policies. While in the Dutch case this mechanism is helped by institutional features (such as the open civil service culture), the civil service in the UK has a low level of autonomy, as argued in section 5.5. In the UK case, therefore, ‘looking for new ideas from outside’ was more connected with a new government that was trying to act on climate change, and the low level of autonomy explains why ideas close to the existing discourse were suggested by the civil service.

In summary, the case studies confirm some of the mechanisms hypothesised by Hajer and Schmidt (see Table 6) and therefore demonstrate that the scope of their theory extends beyond the particular empirical fields that each of them studied (environmental policies in Hajer’s case and explaining different national responses to the process of Europeanisation and globalisation in Schmidt’s case). They also apply to policy initiatives aimed at promoting ‘system innovations’ towards sustainability. However, other mechanisms

hypothesised by these authors could not be observed in the cases analysed here, which thus weakens the claim that these are more general phenomena (the 'role of disjunction markers', 'symbolic politics', 'the social construction of ignorance', and 'rhetorical entrapment').

In terms of the 'role of disjunction markers' Hajer describes this mechanism as policy-making institutions finding "legitimate ways of denying the institutional dimension of the eco-modernist challenge" (Hajer 1995: 269). The discourses analysed in both cases, however, confirm rather than deny that the challenge of greening electricity systems will require institutional changes (e.g. p. 15-18). In terms of 'symbolic politics' Hajer describes this mechanisms as follows: once a policy problem has become impossible to ignore, a highly practical solution is devised (e.g. installing scrubbers to solve the acid rain problem through a technical fix) (Hajer 1995: 269-270). Again the analysis of the cases showed that both storylines explicitly acknowledged that technical fixes were not enough to solve the problem (although technology was deemed important) but that wider changes in institutions, organisations, and the economy (CT) or society (ET) more generally were required. In terms of 'the social construction of ignorance' Hajer referred to cases were "relevant knowledge is held apart from the discussion" (Hajer 1995: 272). The analysis of the empirical material of the two cases could not find any evidence for this phenomenon.

In terms of 'rhetorical entrapment' Schmidt argues that this mechanisms works on the basis of expectations of consistency and coherence, so that actors feel obliged to comply with the policy implications of discourses they accepted in the past (Schmidt 2008: 212). The mechanism as described by Schmidt is a bit ambivalent as linking a new policy proposal to an established discourse or norm is also part of 'positioning and mutual functionalisation' and was covered in the respective section. The distinct feature of this mechanism is that actors who have accepted a discourse in the past (even if only for strategic reasons) are expected to continue to support it for reasons of consistency. In the Dutch case no 'entrapment' could be found as the transitions storyline was shown to be convincing enough to persuade rather then 'entrap' actors (see 'new storylines' section). In the UK case there might have been some 'rhetorical entrapment' if one assumes that policy makers did not 'buy' the 'innovation gap' rhetoric used to justify the Carbon Trust, but merely

supported it because it relied on a more general discursive commitment to supporting innovation which they accepted in the past. However, there was no evidence found during the analysis to justify this assumption. Interview evidence rather points to a process of persuasion than entrapment (e.g. in interview 26: “The only people who *believe* in the innovation chain are bureaucrats” [emphasis added by FK]). This mechanism therefore cannot be considered an important explanatory factor in these two cases.

The case studies also contribute to theory development by suggesting a mechanism not identified by either Hajer or Schmidt, which has been described as ‘looking for new ideas from outside’. Wider empirical analysis is needed to analyse whether this is a more common mechanism.

Table 6 below summarises the mechanisms discussed above with regard to the two case studies. It shows the different ways in which mechanisms of discursive politics enable, shape and constrain policy and institutional change.

Table 6: The discursive mechanisms explaining the case studies

Mechanisms	NL case study	UK case study
'new storylines transforming interests'	storyline redefined problem perception of VROM and created interests of EZ into long-term change of energy system	
'positioning and mutual functionalisation'	'transitions' storyline was linked to liberalisation and innovation agenda as well as commitment to 'green business opportunities', which made the storyline more acceptable within EZ	DETR, DTI, Treasury perceived storyline as in line with their interests and supported policy change
'need for sensory experience'	face-to-face interaction between policy makers and researchers fostered trust and led to a process in which 'transition' storyline was created jointly through a highly interactive process which gave it credibility	close cooperation between civil servants and members of ACBE fostered trust and helped actors to think along similar lines; this cognitive resonance was the cement for the discourse coalition
'structured ways of arguing'	storyline resonated with 'structured ways of arguing' ('market failure', environmental concerns, arenas) and therefore added credibility to the discourse coalition, but also limited the scope for more radical institutional change	'developing low carbon technologies' storyline built on 'market failure' argument which was central to legitimising any policy action in energy policy
'black boxing'	necessity of a 'transition' was 'black boxed', which helped steer away criticisms that structural change is unnecessary and that an optimising strategy might be sufficient	discourse coalition accepted 'black box' of 'no picking winners by government' and used argument in favour of setting up independent Carbon Trust
'the discursive creation of macro actors'		business actors such as Lord Marshall or ACBE had a central role in the discursive struggles around the climate change programme and the Carbon Trust
'looking for new ideas from outside'	civil servants were looking for new ideas because of existing dissatisfaction with NEPP 3, which was amplified by the 'transitions' discourse coalition	government demanded 'shift in gear'; civil servants were looking for new ideas

In terms of the way in which discourse can lead to policy change, the starting hypothesis of this thesis was that political struggles about meaning within existing institutional contexts enable, shape and constrain policy initiatives aimed at 'system innovations' in electricity systems in important ways. Based on the empirical evidence in this thesis, it is argued that these struggles about meaning can play out in rather different ways. This thesis suggests that there are three distinct ways in which discourses can influence policy change, as detailed below.

1) New storylines can shape policy change by re-framing policy problems and/or changing the perceived interests of actors.

In the above discussion it has become clear that several mechanisms ('new storyline transforming interests'; 'looking for new ideas from outside'; 'need for sensory experience') effect policy change by reconceptualising the policy actors' problem understanding and/or transforming actors' interests. By providing a new understanding of the policy problem regarding how to make the electricity system more sustainable ('transition' or 'developing low carbon technology'), these ideas provided cognitively convincing and normatively appealing ways to act and therefore channelled political activity in certain directions rather than others. As Fischer pointed out, political power struggles are in part played out "through arguments about the 'best story'" (Fischer 2003: x). The case studies highlight these discursive struggles and foreground the cognitive dimension of policy processes. This thesis thus strengthens the claim that interests cannot be seen exclusively as structurally derived but are dependent on the perception of the situation that an actor is in.

2) New storylines can be used strategically by actors to promote policy change in line with their existing, perceived interests, which can change the policy output when compared to the output arising from pure 'politics as usual'.

However, reconceptualising problem definitions and/or interests is only one way in which discourses can contribute to policy change. The thesis also found that in several instances, even though the storylines did not challenge the perception of the problem or transform

interests, actors promoted them for their own strategic reasons, which helped to bring about policy change. Several of the mechanisms discussed above contributed to this outcome ('positioning and mutual functionalisation', 'structured ways of arguing', 'black boxing' and 'discursive creation of macro actors'). 'Positioning and mutual functionalisation' in particular enables coalitions of actors with differing interests, which can collectively change the outcome when compared to 'politics as usual'. Both case studies have shown how the interpretative flexibility of the storylines enabled wide coalitions to be built, which helped bring about political change.

This finding resonates with Hay who argued that it is important to distinguish between whether a discourse is *deemed to be true* or simply *deemed to be useful* by those who employ it (Hay 2002: 258). In the first case a discourse or storyline is internalised by an actor (ideas are then transformative); in the latter case, it is an actor's intentional, reflexive choice to strategically employ a particular discourse (ideas are then used strategically to, for example, justify reforms which would otherwise be difficult to legitimate). Either way, discourses are central to this process and can change policy outputs when compared to the outputs arising from 'politics as usual'.

3) The persistence of institutionalised discursive commitments can block new storylines advocating policy change or shape its direction.

The analysis has shown how 'structured ways of arguing' pose an obstacle to radically new storylines. The storylines analysed in the case studies were therefore tied into these accepted discursive formats. Existing 'black boxes' also pose obstacles for new storylines in terms of creating space for political change. However, the analysis also demonstrated how actors can creatively overcome such obstacles by strategically building on 'structured ways of arguing' to create a viable coalition for enacting policy change. The Dutch case study showed how actors succeed in 'black boxing' some of the claims of the emerging 'transitions' storyline, which helped to reduce opposition to policy change in line with such claims.

Analysing discursive politics not only helps to understand policy change, therefore, but can also contribute to analysing stability by shedding light on discursive structures. As Hajer has argued: "discourse contains structures that can be as effective in resisting policy change as walls and barbed wire can in preventing trespassing" (Hajer 1995: 275). Storylines "can subsequently themselves become a political reality in their own right and then stand in the way of more reflexive institutional change" (Hajer 1995: 269). This is true in the UK case study for the 'developing low carbon technology' storyline, which enabled the Carbon Trust to be set up but at the same time also prevented more reflexive institutional change, as argued above. The way in which the above-analysed mechanisms work shows how discursive structures can prevent or at least channel policy and institutional change in certain directions.

The table below systematically relates the discursive mechanisms discussed to these different ways of influencing policy processes, as found in the case studies.

Table 7: Different ways in which discourse influences policy change

Mechanism	Reframing policy problems and/or interests	Strategic use of new ideas	Institutionalised ideas blocking new ideas
'new storylines transforming interests'	X		
'positioning and mutual functionalisation'		X	
'need for sensory experience'	X		
'structured ways of arguing'		X	X
'black boxing'		X	X
'the discursive creation of macro actors'		X	
'looking for new ideas from outside'	X		

6.2 Existing explanations of the Energy Transition case

In terms of considering alternative explanations in light of the evidence it is also important to look at explanations which other scholars have thus far suggested for the phenomenon in question (George and Bennett 2005: 217). This query may only be posed on the Dutch Energy Transition case, since such a test is not possible in the case of the Carbon Trust, as there is no prior analysis of why and how this policy initiative came about.

So what does the analysis presented in this thesis contribute to explaining the emergence of the Energy Transition in the Netherlands in contrast with existing studies? Rene Kemp and Derk Loorbach proposed three reasons why transition management was adopted by Dutch policy makers (Kemp and Loorbach 2005). These explanations will be discussed in the light of the findings presented above.

The first reason given by Kemp and Loorbach is that the iterative aspects and in-built flexibility of the transitions management approach helped reduce concerns about future control. Those two attributes refer to the management process and the possible interpretation of transition management as a top-down control process. Rotmans, Kemp and other TM advocates always tried to avoid this interpretation by stressing iterative decision making, small steps and modulation as important elements of TM (Rotmans, Kemp et al. 2001a; Rotmans, Kemp et al. 2001b). The analysis presented above shows that the flexibility of the concepts, however, goes significantly beyond that. Transitions are interpreted in different ways by different actors and therefore allow different actors to identify themselves with this goal, even when their interpretation sits uneasily with the one originally formulated by Rotmans, Kemp et al. One example of this is that a business actor involved in the energy transition interpreted the ‘simple’ substitution process of unleaded for leaded petrol as an example of a successfully managed transition (interview 14). Surely the original discourse coalition promoting the ideas of ‘transitions’ would not agree with such a narrow interpretation? The point is that the flexibility goes beyond just avoiding the impression that transition management is about future control. The ideas of TM are flexible in several other senses: with regard to the goals (structural system change versus ‘normal’

innovation), the means (emphasis on participatory process versus elaborate process architecture including participation but also control policies), the language (innovation, participation, learning) and the role of government (facilitator vs. taking the lead as well as putting the regime under pressure). All these flexibilities enabled political and stakeholder support for this initiative across a wider coalition of actors than would have been the case without this interpretative flexibility.

Secondly, Kemp and Loorbach argued that transition management did not directly threaten existing policies, which made it appealing to policy makers. The analysis above confirms this finding. Processes of 'positioning and mutual functionalisation' created win-win situations in which other departments supported the 'transitions' storyline because it enabled EZ in particular to link TM to their liberalisation and innovation agenda as well as their commitment to 'green business opportunities'. EZ's endorsement made the storyline acceptable for a wider coalition but it also reinforced the storyline. The storyline was seen to support EZ's interest in regaining steering power lost through liberalisation. However, TM has in turn been subsequently criticised as a policy approach with a 'lot of talking and no action' because it linked in with rather than threatened existing policies. So again, while this feature of the storyline made it politically more palatable, it also posed difficulties in the discourse institutionalisation as the adding on of new initiatives such as the Energy Transition did not lead to a coherent policy mix, as hoped by TM advocates (Rotmans, Kemp et al. 2001a). Instead, existing goals and instruments are not well aligned with the aim of 'system innovations' towards a sustainable electricity system (Kern and Howlett forthcoming, 2009).

Thirdly, Kemp and Loorbach claim that it proved difficult for sceptics to argue against an approach focused on innovation and learning (Kemp and Loorbach 2005: 129). This thesis agrees with this point but it needs to be added that it was not only difficult to argue against it, but that the language in which TM was presented and the concepts used relied on historically specific ways of arguing. The 'transitions' storyline, for example, partly relied on the familiar market failure argument which is central to legitimising policy action in energy policy, and the language around 'arenas' spoke to the polder model norms. In

addition, there seems to have been a lack of a viable alternative for the central concept of NEPP 4, as the discourse coalition promoting the 'transitions' storyline was very successful in engaging with policy makers involved in the preparation of NEPP 4 and before, minimising space for alternative framings.

So what is the value added by the analysis presented above compared to the explanation provided by Kemp and Loorbach? On the one hand the analysis confirms their explanation, but it also enriches and deepens it by specifying the discursive mechanisms through which TM became accepted. On the other hand the analysis also highlights an additional mechanism which Kemp and Loorbach missed, which Hajer called 'structured ways of arguing': the TM language partly appealed to policy makers because it used the familiar market failure argument and was close to the polder model language. The analysis presented here thus contributes new insights to other explanations of the case.

6.3 Alternative interest-based explanations

To avoid a 'confirmation bias' of the analysis presented above (Bennett and Elman 2006: 460), it is important to consider possible alternative explanations. Looking at other possible explanations is particularly relevant here, as Schmidt and Radaelli have argued that while discourse can be an important factor in the explanation of policy change, it is one amongst a number of possible factors and should not be considered in isolation (Schmidt and Radaelli 2004). In order to contrast the explanation of the cases presented above based on discursive mechanisms, the following will consider possible interest-based explanations for the emergence and shape of the two policy initiatives.

In line with the discussion in the theory chapter, realist, materialist or rationalist explanations of politics generally see the motivation and behaviour of actors as driven by maximising personal utility – ideas are seen merely as rationalisations of interests (Fischer 2003; Price 2006). Material interests are usually hypothesised to be relatively stable over time, rational in their attempts to maximise utility, and are therefore to a large extent 'knowable' (Blyth 2002). In line with these claims, it can be hypothesised that both the

Energy Transition and the Carbon Trust were the outcome of actors' attempts to advance their self-interests. The question is whether it is plausible that the observed processes were driven exclusively by actors' material self-interest? In the Dutch case, three main groups of actors were pushing the energy transition policy initiative – researchers and consultants as well as policy makers from different departments. Business actors were less involved. Their respective interests will be discussed below.

One could argue that researchers played an active role in developing the 'transitions' storyline because they wanted to increase their personal influence on policy making and thereby boost their professional standing or 'make a difference' in solving persistent environmental problems. The involved consultants also have an interest in 'selling' new ideas and tools to policy makers. However, such a generic interest is of indeterminate influence on the kinds of policy and institutional changes recommended by such 'policy entrepreneurs' if the aim is simply to gain influence or 'sell ideas'. It does not explain why certain ideas were advocated and subsequently accepted by policy makers and not others.

It can be assumed that VROM policy makers had an interest in reviving environmental policy with new concepts to tackle persistent environmental problems as they were looking for a key idea for NEPP 4. Again, while this was probably the case, it does not explain the kind of new policy approach subsequently adopted. In particular it does not explain why nine different departments saw the 'transitions' approach as being in line with their own departmental interests, which would usually be believed to clash.

The liberalisation agenda was dominant in EZ so energy policy makers were primarily interested in promoting short-term economic efficiency and competition in the energy sector. The 'transitions' storyline partly transformed EZ's interests, which became much more focussed on long-term changes in the energy sector. However, the 'transitions' storyline also appealed to EZ's interest in regaining steering power lost through liberalisation and in creating business opportunities. While from EZ's traditional business opportunities perspective, marketable new technologies are a desirable outcome, civil servants within EZ internalised the 'transitions' storyline to the extent that they were self-

critical of the implementation of the Energy Transition's focus on technologies (Dietz, Brouwer et al. 2008).

Business actors were surely in favour of additional government funding for long-term R&D given the focus of their own R&D spending on short-term priorities. But again, this does not explain the 'shape' of the Energy Transition, as a 'normal' R&D programme would have been sufficient to meet this particular interest.

As for the UK case, the main actors in favour of a Carbon Trust were ACBE as well as a group of civil servants mainly from DETR and DTI. Their respective interests will be discussed below.

In the UK case study the Labour Government overall had an interest in doing something to tackle climate change in order to appeal to green voters as it had made environmental issues a key concern in the 1997 election campaign, while at the same time 'New Labour' was keen to present itself as the representative of the interests of industrial and financial capital (Hay 1999; Gamble and Kelly 2001; Ludlam 2004). Civil servants in DETR had an interest in fulfilling the 'New Labour' Government's demand for a 'shift in gear' in carbon reductions and energy efficiency.

However, it is not easy in this case to directly link this interest with the Climate Change Levy and the Carbon Trust. Why were these initiatives believed to be appealing to green voters and business? Without taking into consideration existing institutions and dominant discourses it seems hard to explain why a Carbon Trust was seen as an appropriate policy response. The discursive institutional analysis points to its fit with existing discursive and institutional commitments around market failures and 'business solutions matter'.

The Carbon Trust policy initiative addressed the Treasury's concern for revenue-neutrality, gave DETR/DEFRA the opportunity to substantially increase funding for their energy efficiency work and was in line with DTI's interest in promoting low carbon business

opportunities[44]. However, it was the 'developing low carbon technology' storyline which created the perception of the new policy initiatives as a win-win-win situation in which it simultaneously helped to advance the interests of all the main departments involved.

Why did the large manufacturing companies represented in ACBE not oppose the CCL? According to interview evidence, business actors were against the CCL unless there was a recycling mechanism to avoid additional tax burden. According to this line of reasoning the Carbon Trust was therefore a result of 'politics as usual' as the Government needed to make concessions to industry to achieve business acceptance of the CCL. This 'deal' is only in line with ACBE's interests if the recycling more then compensates their additional tax spending. It is unclear whether this was believed to be the case. Even with overall recycling mechanisms in place, some individual companies will pay more levy then they will gain from the reduction of national insurance contributions. The exemption of energy-intensive businesses from the CCL might have contributed to securing ACBE's agreement in this respect. However, a complementary explanation could be that a committee charged with advising government on environmental issues at that point in time had been entrapped (Schimmelfennig 2001) in the climate change discourse (meaning that it could not legitimately oppose the idea of climate change) and could therefore not oppose a market instrument aimed at reducing emissions. In line with sociological institutional thought and its 'logic of appropriateness', one could argue that the discourse made it impossible for ACBE to oppose something which was not in their economic interest. This was crucial as without business support for the CCL, 'New Labour' – who wanted to appeal to businesses – would not have implemented these policies. More research would be necessary to see which of these two hypotheses holds.

ACBE's main interest in the Carbon Trust was, as they openly stated, to "allow greater business involvement in recycling of revenues" (ACBE 1999: 2). ACBE therefore preferred the introduction of a new organisation such as the CT over adding a business stream to the EST, which already had a board and where the receipts might be less effectively ring-

[44] An interviewee confirmed that it was the business support part of DTI rather than the energy part of DTI that took an interest in the CT idea (interview 3). This supports the hypothesis that DTI's main interest in the CT was because of its potential to create business opportunities.

fenced. Opposition to the Carbon Trust came from certain business actors who profited most from the spending of the EST (such as ACE or BEEF). They also argued that energy efficiency should have the priority, which was more in the interest of their constituents[45]. Also, the EST itself lobbied for having a business stream alongside its domestic stream of work. These examples show how interest-driven lobbying took place during the discussions about the possibility of setting up a Carbon Trust. They show how incumbent business actors were trying to influence the policy development in line with their own interests. However, more analysis would be needed to ascertain why some business actors were more successful (ACBE) in lobbying for their interests than others (ACE, BEEF). Typically rational choice scholars would argue that actors with more resources are more powerful. A simple reference to interests does not provide an explanation of why the Government decided to set up the Carbon Trust separately from the Energy Saving Trust, unless ACBE is hypothesised to be more powerful then other business actors. In this case one would need to specify on what resources this power is based (for example material, discursive, structural). In ACBE's case, access to Cabinet members, combined with the breadth of the discourse coalition, including civil servants from DETR/DEFRA, green NGOs and Lord Marshall, as well as support from the Treasury and the Prime Minister might have tipped the power balance towards ACBE. The argument is that while 'politics as usual' played a role in this policy process, it does not necessarily explain the policy outputs without a reference to broader discursive developments which add credibility and legitimacy to some interests more than to others.

In summary, instances of interest-driven 'politics as usual' played a role in driving the policy processes analysed, but do not on their own provide sufficient explanation for the shape of the policy initiatives and the dynamics of the policy process. Through a rational choice lens the ET can be seen as the product of free-thinking civil servants trying to advance their departments' interests, and entrepreneurial researchers who wanted to gain policy influence. It was facilitated by consultants who earn a living selling new ideas and concepts. However, such an explanation does not convincingly explain the shape of the ET.

[45] ACE being the Association for the Conservation of Energy and BEEF being the British Energy Efficiency Federation.

Nor does it explain how the ideas of the ‘transitions’ storyline were created or the process by which they convinced policy makers from nine different departments that the ‘transitions’ storyline was in line with their own departmental interests. The CT can be seen as having been adopted because it was viewed to be in the interests of the ‘New Labour’ Government overall, as well as large, energy-intensive businesses. The specific shape of the CT as a business-led, independent company allows large businesses more influence on CT spending. Arguments based on rational choice theory are less convincing when it comes to explaining why the CCL policy ideas were not opposed by business and why ACBE ‘won’ against ACE, BEEF and the EST. The agreement of the different departments involved in the CCL and the CT relied on them perceiving these policy initiatives to be in line with their own departmental interests, which had to be created discursively.

The overall argument is that while rationalist or material explanations offer some useful insights, they are not on their own able to account for the shape of the policy initiatives or the dynamic processes leading to these policy outputs. The examples show how the perceived interests of actors interact with discursive and institutional factors. The general argument is that while ‘politics as usual’ plays a role in these two policy processes, it does not necessarily explain the policy outputs without reference to the broader discursive developments that add credibility and legitimacy to some views more than others, or that create certain perceptions of interests.

On the other hand the analysis presented in chapters 4 and 5 has shown that the analytical framework has been better able to explain the emergence of ET in the Netherlands and the CT in the UK as a process of discursive struggles within an institutional context, than it has the practices of their implementation. An explanation of the processes and shape of the implementation of the policy initiatives relying solely on institutional and discursive factors is incomplete. Other factors that were decisive in terms of why the implementation of the storyline took a certain shape emerged from the analysis (such as the CT’s need to legitimise its activities as distinct from other actors). Section 7.4 on ‘avenues for future research’ will return to that point.

6.4 The relationship between discourses, institutions and interests in policy change

The debate about the explanatory value of discourse versus interests versus institutions is a long-standing one in the social sciences. As pointed out earlier, the aim of this thesis was not to resolve this debate, but rather to elucidate the ways in which discourses can make a difference to policy outputs (discussed in section 6.1) and the ways in which discourses were found to interact with institutions and interests in the two cases studied.

The 2x2 matrix below (see Figure 12) clarifies the expected policy outputs based on the relationship between new discourses and existing institutions as well as new discourses and existing interests of the main actors involved in a policy field. The two cases are positioned within this matrix according to the analysis presented above.

Figure 12: The relationship between discourse, interests and institutions in policy change

		Relationship between new discourse and existing institutions	
		New discourse and existing institutions are mutually supportive	*New discourse challenges existing institutions*
Relationship between new discourse and existing interests	*New discourse reflects existing interests*	little or no policy change **UK**	Policy change in line with new discourse
	New discourse transforms existing interests	Path-dependent evolution of policies **NL**	Radical policy change ('punctuation')

The Energy Transition was intended by the discourse coalition promoting it to challenge existing institutional norms and practices (such as polder model consensus-orientation, focussing instead on frontrunners) which could have led to radical policy change. However, it was implemented in line with these norms and therefore led to a path-dependent evolution of policies, given the fact that the storyline partially transformed the interests of EZ. Otherwise little or no policy change could be expected to arise from the emergence of the storyline. In the UK case the 'developing low carbon technology' storyline mainly reflected existing discourses and interests and was largely in line with institutional norms and routines (such as the separation of policy making and delivery, and market-based policies). However, the new storylines challenged certain institutional norms (technology-neutral policy) and therefore led to some degree of policy change in line with the new storyline. This matrix enables more systematic thinking in explaining and predicting the likely outputs of policy processes depending on the interplay of discourses with institutions and interests. Radical policy change is only expected to occur when a new discourse transforms existing interests and successfully challenges existing institutional commitments.

6.5 Limitations of the analysis

The case studies also point to a number of limitations of the kind of analysis developed in this thesis.

As discussed above, at times it has been difficult to discriminate between alternative explanations, such as whether a storyline is used strategically by actors following existing self-interests or whether it has transformed their interests. The process tracing methodology used in this thesis has enabled various insights into these processes, but because of potential strategic response biases of interviewees it is not always possible to clarify the interplay between discourses and interests sufficiently. As pointed out earlier, Schmidt argued that discourse is a complicated variable as "the ideas it articulates cannot easily be separated from the interests that find expression through it" (Schmidt 2003: 129). The evidence available was not in all cases sufficient to rule out competing explanations and it is therefore important to be reflexive and transparent about these limitations. However, the

overall findings about the role of discursive politics in policy processes are considered robust and resonate with findings in the pertinent literature (e.g. Laird 2001; Blyth 2002; Campbell 2002).

Another limitation of the analysis is that it is very difficult to determine the relative importance of the discursive mechanisms discussed, because there is no obvious way of measuring their importance. A simple counting of the number of instances in which they occur does not take into consideration that single instances (for example a new storyline transforming the interests of a key actor) can be sufficient to drive policy change. An additional difficulty in assessing their relative importance is that the mechanisms can interact. They can be cumulative ('new storyline' transforming interests of some actors and linking up with some existing interests of other actors through 'mutual functionalisation') or they can counter each other (e.g. new storyline creating pressure for change versus 'black boxing' presenting obstacles to change). Further consideration is necessary to devise methods capable of solving these issues.

The empirical evidence allows the conclusion that the policy changes observed were driven by a number of mechanisms. However, there is a chance that some of the observed patterns are contingent on particular conditions being present in the two case studies. The outcome of each mechanism might be different under circumstances that differ from those studied here and different mechanisms can produce the same empirical result (Sayer 1992: 108). Research that is based on two case studies does not allow certainty about the functioning of each mechanism and, in particular, the question of under which conditions it leads to which outcomes is unclear. However, one can be more confident in the overall pattern: in both cases discourses, institutions and interests interacted in a variety of ways to produce the analysed policy change. The corroboration of the results through other case studies would allow a better understanding of the nature of each of the mechanisms under different circumstances (see section 7.4 on future research avenues).

7 Conclusions

This thesis has analysed the role of discursive politics in policy initiatives aimed at governing 'system innovations' towards sustainable electricity systems. It has analysed two cases in depth (chapters 4 and 5) and has drawn out theoretical implications by looking across the two cases (chapter 6). This chapter will present the conclusions of this thesis by answering the research questions posed in chapter 1.

7.1 Answering the research questions

In order to investigate the politics of policy initiatives aimed at stimulating 'system innovations' towards sustainable electricity systems, three research questions were posed. Each will be answered below.

1. How are the national governments in the UK and the Netherlands trying to foster 'system innovations' towards more sustainable electricity systems? Why were the two policy initiatives designed and implemented in the described ways?

The Dutch Government in its Fourth National Environmental Policy Plan published in 2001 acknowledged the existence of a variety of persistent environmental problems such as climate change and argued that systemic change in societal systems such as energy is necessary to achieve sustainability. It has subsequently set up a policy initiative, the Energy Transition led by the Ministry of Economic Affairs, to manage the transition towards a more sustainable energy system. The project led to a number of institutional changes and initiated a stakeholder process aimed at exploring transition pathways by conducting transition experiments supported by government funds. The details of this initiative have been set out in chapter 4.

In contrast, as part of the UK 2000 Climate Change Programme, the British Government set up a company limited by guarantee, financed by government but independent in its management and charged with the task “to accelerate the transition to a low carbon economy” (Carbon Trust 2007a). This organisation, the Carbon Trust, helps companies and public sector organisations to reduce their carbon emissions, supports the development of low carbon technologies as well as the deployment of existing low carbon technologies and provides policy advice to government. Since being set up in 2001 the Carbon Trust has seen substantial growth in its funding and has developed a variety of innovative funding vehicles to fulfil its mission. The details of this initiative have been set out in chapter 5.

Both policy initiatives have been promoted by a coalition of actors who discursively produced a normatively appealing and cognitively convincing storyline which enabled this policy change to happen. These storylines framed the policy challenge in particular ways, which partly shaped the substance of the policy initiatives. In the Netherlands a coalition of civil servants and researchers used a routine policy strategy development process to promote a new ‘transitions’ storyline which emphasised the necessity of structural change in societal subsystems and contributed to an acknowledgement that existing policy approaches had failed. This discourse coalition emerged during the 1990s through a series of sustainable technology programmes and co-produced the central elements of a ‘transition management’ approach. The ‘transitions’ storyline enabled the Energy Transition to be set up. The case study also shows how the implementation of the initiatives faced obstacles posed by institutional rigidities such as existing norms and practices, which led to a capture of the process by incumbent companies and a falling back on quite traditional instruments to stimulate innovation rather than initiating broader societal learning processes.

In the UK a coalition of business actors and civil servants used a window of opportunity when the UK 2000 climate change programme was introduced to promote a ‘developing low carbon technology’ storyline which emphasised the necessity of having an independent, business-led organisation to promote the development of low carbon technologies and energy efficiency by recycling receipts from the Climate Change Levy. This discourse coalition strategically used concerns about competitiveness to argue for direct support for

the deployment and development of low carbon technologies. The storyline is closely linked to the dominant discourse around market solutions to tackle climate change. The CT thus focussed on technological innovations and the commercialisation ('route to market') of these technologies. However, through its policy advice work the CT also challenges government thinking around the efficacy of market instruments such as the renewables obligation and argues for technology-specific instruments. The case study highlights some of the institutional barriers this organisation is facing, such as EU state aid rules.

A number of discursive mechanisms found in the literature where shown to play a substantial role in explaining why the two policy initiatives were designed in the described ways. In terms of the implementation of these storylines in policy practices, the suggested framework faced difficulties in explaining some of the detail of the discourse institutionalisation.

2. To what extent have they delivered on their stated aims in terms of outputs and outcomes?

In terms of outcomes, as 'system innovations' are long-term processes, it is too early to tell whether the policy initiatives will lead to 'system innovations' in the long run, but a number of indicators are available to judge what they have delivered so far (such as funding for projects, tonnes of carbon saved, future potential savings).

Both policy initiatives were set up in 2001 and have since funded a variety of activities hoped to contribute to 'system innovations' in the electricity system. In both cases non-trivial resources have been invested by the government and private actors. The Energy Transition funded projects through the UKR and EOS-DEMO scheme between 2004 and 2007 with €160.2 million, which levered private expenditure of €1237.1 million (see Table 3 and Table 4). The Carbon Trust's programme spending amounted to £285.6 million during the same period (see Figure 11). The leverage of private expenditure of the Carbon

Trust's Innovation programme has been 1:2 and for its venture capital investments 1:10 (NAO 2007b: 5).

In terms of realised savings of carbon dioxide emissions, the latest available estimates for both initiatives show that the projects funded under the initiatives have contributed to cutting emissions. As for the Dutch case study, in terms of the projects funded under the UKR and EOS-DEMOS scheme, these led to a CO_2 emission reduction of 3.484 million tonnes/year between 2004-07 (see Table 3 and Table 4). For the EOS-DEMOS projects a so-called 'theoretical repetitive potential' is calculated in case the technologies demonstrated in these projects are implemented in the market[46]. The 'Energy Innovation Agenda' report estimates the potential of these technologies to be about 22.3 million tonnes of CO_2 reduction annually (SenterNovem 2008: 113). As for the UK case, according to an assessment by the National Audit office,

> "In 2006-07, the advice and financial support for measures to reduce carbon dioxide provided by the Carbon Trust resulted in an estimated reduction in carbon dioxide emissions by its customers of between 1.2 million and 2.0 million tonnes. … In addition the Carbon Trust estimates that its work supporting the development of low carbon technology up to March 2007 could lead to an annual reduction of between 13.7 million and 20.7 million tonnes of carbon dioxide by 2050" (NAO 2007b: 5)[47].

In a broader sense, the Energy Transition has contributed to a 'sense of opportunity' regarding sustainable energy among policy makers and business actors. According to SenterNovem, the "Energy Transition has led to successful results in various sectors in the Netherlands"[48]. SenterNovem points to the following examples: the growing market for bioplastics, the use of carbon from industrial processes as fertiliser in greenhouses, and the refurbishment of social housing with innovative energy-saving technology. The large number of stakeholders involved in the seven transition platforms and their 15 working

[46] The report points out that it is difficult to assess whether or not this potential will be fulfilled as this depends on assumptions such as opportunity for success, market developments and knowledge dissemination as well as investment climate.
[47] Again, predicting such potential impact is difficult. The CT has developed a tool to estimate the technical potential for future carbon dioxide savings related to specific technologies and the market potential with and without the Carbon Trust's intervention. This has been reviewed by KPMG which has provided an assurance statement on the Carbon Trust's application of this methodology (NAO 2007b: 24)
[48] See http://www.senternovem.nl/energytransition/dutch_approach/results.asp; last updated: 06.02.2008.

groups, as well as the leveraged private sector spending on transition experiments and technology demonstration projects, shows the interest and commitment of stakeholders to work towards a sustainable energy system. Within government the number of civil servants involved in managing the Energy Transition has increased from 5 to 60 over the last years. The Energy Transition also received mainstream public attention for the first time when the transition taskforce's first report made it onto the eight o'clock national television news. The facilitation of stakeholder innovation networks to select specific themes for the future energy system to work on, to identify obstacles and opportunities, to come up with strategic visions, and to conduct concrete projects to learn about diverse options is an achievement, which has also led to some institutional change as outlined in chapter 4.

In a broader sense, the Carbon Trust in the UK has arguably had an influence on business's awareness of the importance of climate change and commitment to cutting carbon emissions (interviews 5; 13; 20; 22; 24). In particular it is claimed to have "reshaped UK industry's attitude to climate change so I think there are lots of businesses who see it as a business opportunity, not a regulatory constraint. And that's an amazing achievement" (interview 5). In terms of impact on business behaviour, the CT has been running an energy efficiency accreditation scheme "which has made some difference" (interview 22). The CT's enhanced capital allowances scheme is claimed to have had an influence on business behaviour by forcing energy efficiency standards, which was "quite intelligent use of that opportunity" (interview 3). This area also includes carbon management services, such as energy audits for large companies and public sector organisations, which the Carbon Trust created (DEFRA 2006) and "now carbon management is a common term" (interview 23) and a lot of companies have implemented emission reduction strategies (interview 6). The latest area of work has been on carbon footprinting and product labelling, where the Carbon Trust's work is beginning to really shape the way companies think about their supply chain emissions (interviews 6; 22; 23).

However, an important remaining question is whether these activities will in the long term contribute to 'system innovations' towards more sustainable electricity systems. Here, the most that is possible is an informed guess.

As for the Energy Transition, the long-term vision of the project to cut carbon emissions by 40-60% by 2030 and aiming at structural change in the energy system by 2050 is ambitious. Combining these goals with a process architecture aimed at learning and stakeholder involvement is novel (Kern and Smith 2008: 4101). The ET has largely followed the original TM suggestions in terms of the architecture of the initiative but the process was captured by incumbent actors and has been narrowed down (focus on technologies, focus on economic opportunities, focus on incumbent actors, neglect of behavioural or lifestyle issues), so it is doubtful whether it will achieve its original ambitions (Kern and Smith 2008). Furthermore, liberalisation is still an important goal of Dutch energy policy, which makes it difficult to achieve a transition in the long term as some of the instruments are more aligned with that short-term goal rather than with the long-term aim of 'system innovation' (Kern and Howlett forthcoming, 2009). However, capacity-building through the Transition Competence Centre, which is training future transition professionals, or the continued interaction with researchers might enable more traction of the policy initiative in the future if support from a broader power base is achieved.

As for the Carbon Trust, it has developed a variety of novel funding mechanisms which seem sensible and useful for contributing to 'system innovations' by supporting niche actors and providing useful advice to businesses and policy makers and by increasing awareness for the need to move to a low carbon economy. However, the mindset with which it operates is too narrowly focussed on business opportunities and less so on the wider social processes underlying innovation (for example, public acceptance, skills or network building). While it has sometimes adopted a systems view, such as with smart metering, the main thrust of its programmes is on technology acceleration. The analysis presented here has raised doubts about the possibility for a change in this respect as long as the dominance of the discourse around markets delivering the solutions to climate change, given the right incentives, is not challenged more substantially than has been the case thus far. While dismantling dominant discourses which have become embedded in institutions is a difficult endeavour (Scrase and Ockwell 2009), maybe the current macro-economic climate in conjuncture with the devolution process provides just this opportunity. However,

it is also important to note that the policy landscape has changed radically since the Carbon Trust was set up: while the 2000 Climate Change Programme and the 2003 Energy White Paper favoured a future electricity system based on (small-scale) renewable technologies, for which the Carbon Trust was a useful funding vehicle, policy debate now centres around large scale options like offshore wind farms, carbon capture and storage technologies, and nuclear power has made a political return. A variety of large funding initiatives (such as the Energy Technologies Institute as a ten-year £1 billion public–private partnership) have been set up. While a transition to a secure and low carbon economy is still the declared policy goal, ideas about what such a system could look like and what would be suitable policy mechanisms to help bring it about have changed substantially. In the context of the setting up of the ETI a senior civil servant responsible for energy policy in DBERR commented:

> "the CT has somehow managed to get itself into a space where it was really quite important in marginal energy technologies [such as marine] but not very important in mainstream energy technologies [such as nuclear]" (interview 4).

The Carbon Trust thus faces the challenge of continuing to be seen as an effective organisation in contributing to a transition towards a low carbon and secure economy. Otherwise the likely change in government at the next election might jeopardise the future of the Carbon Trust.

3. What are the political constraints and difficulties that each has encountered, why do these arise and what are the lessons for government initiatives aimed at fostering innovation towards more sustainable energy systems?

In terms of political constraints and difficulties and why these arise, the analysis has shed light on several discursive mechanisms and the interplay of ideas with existing institutional arrangements and interest-based politics. The analysis can be summarised in four central claims, as set out below.

First, new storylines can create potential for policy and institutional change if the discourse coalition constructing and promoting them can appeal to existing or emerging values and cognitive commitments while at the same time recasting them into new directions. The

analysis showed how both emerging storylines had to tie in with existing discourses (for example the commitment to liberalisation, privatisation and market mechanisms), which illustrates just how powerful these are. The case study analysis shed light on the difficult rhetorical balancing act of claiming that the neoliberal discourse is not enough to achieve a sustainable transformation of the electricity system, but without alienating actors committed to this dominant discourse. This balancing act requires political diplomacy on the part of the involved discourse coalitions. New storylines either need to address or re-align interests of key actors.

Second, a number of mechanisms such as 'new storylines transforming interests', 'structured ways of arguing', 'positioning and mutual functionalisation' etc have been highlighted in the analysis. Some mechanisms can have a double-edged sword nature: while the interpretative flexibility of storylines might increase their acceptability for a wider coalition of actors, in the implementation of policy initiatives such flexibility can easily lead to a 'watering down' of the ambitions of the storylines and a capture by incumbent interests. The ET initiative was embraced by incumbent actors but was then 'watered down' in its implementation. Open contestation has not taken place but capture has constrained the ability of the policy initiative to lead to more radical policy change. The outlined mechanisms help to understand and explain the dynamics of these policy processes.

Third, the analysis has shown that a clash of emerging storylines with established discourses is not the only way to achieve policy change. The UK case study demonstrates that a new storyline which is largely in line with the dominant discourse can also lead to quite substantial policy and institutional change by rallying existing interests and building coalitions across actors which do not necessarily have shared interests.

Fourth, the analysis has shown that interest-based politics played a role in explaining some of the features of the implementation of the 'developing low carbon technology' storyline in the Carbon Trust. Even in situations of uncertainty, interests still play a crucial role in explaining policy outputs. This reinforces the recursive understanding of interests and ideas. The politics of implementing new policy initiatives are not only influenced by the interplay

of existing discourses, emerging storylines and institutions, but also by interest-based politics.

These claims support the theoretical hypothesis underlying the thesis, which is that discursive struggles and their institutional context enable, shape and constrain political change through contestations of meanings and re-ordering of understandings. However, it has also been acknowledged that such explanations need to be complemented by interest-based factors and that contestation or reframing of interests is not the only way in which discourses influence policy processes.

The analysis has highlighted that the discursive interplay between actors is also influenced by institutional factors. Formal as well as informal institutional rules can both enable and constrain the 'room to manoeuvre'. Both initiatives have met institutional constraints which have limited their ability to contribute to wider policy and institutional changes. These constraints partly derive from a 'misfit' of the new initiative with existing institutional rules (such as EU state aid provisions) and partly from the persistence of existing routines (such as the familiar use of cost benefit analysis or polder model practices). Even when a storyline committed to different practices is accepted, in the concrete institutionalisation of the storyline the suggested practices were adjusted to be in line with polder model routines (as civil servants 'are infected by polder model ideas'; interview 17). New storylines also face difficulties when they challenge dominant discourses that have been embedded in powerful formal, institutional arrangements (such as the commitment to competition, which has been institutionalised in Ofgem). However, the recent changes to the remit of Ofgem show that it is possible to alter even such formal institutions if pressure for change abounds.

In terms of the policy lessons learned from this analysis, the next section will detail the policy recommendations drawn from this thesis.

7.2 Policy recommendations

This thesis was aimed at providing analytic explanations rather than at producing policy recommendations. Nevertheless, the policy initiatives analysed in this thesis address a crucial and topical policy problem so it is important also to use the analysis to reflect on possible policy recommendations.

The most important message for policy makers emerging out of this thesis is the need to recognise that attempts to steer 'system innovations' towards sustainable electricity systems are political, not just economic or technological, challenges. 'System innovations' are political processes which have to overcome both technological and economic as well as institutional lock-in and path dependency. Too often, especially in the framing of the problem in the UK, but also in the academic debates about transition management, steering towards sustainability is seen as unproblematic. The recommendation to policy makers is to admit that these processes are political and to make the underlying political choices more transparent.

The second lesson is about the possibilities for policy learning[49]. The two case studies confirm that governing socio-technical change is politically challenging and that policy recommendations under the banner of 'transition management' are therefore too managerial and functionalistic. Nevertheless, academics in the UK have thus far viewed the Dutch transition model as an inspiring approach which could possibly be used to complement the UK's policies in this area (see e.g. Foxon and Pearson 2007; Geels, Monaghan et al. 2008; POST 2008; Steward 2008). The 'spill-over' of some of the TM ideas into the UK[50] suggests that policy learning is possible; as does the political science literature on policy learning, lesson-drawing and policy transfer (Rose 1991; Dolowitz and Marsh 2000; Smith 2004).

[49] Dolowith and Marsh define policy learning broadly as a "process in which knowledge about policies, administrative arrangements, institutions and ideas in one political setting (past or present) is used in the development of policies, administrative arrangements, institutions and ideas in another political setting" (2000: 5).

[50] For example at the beginning of September 2009, the Scottish Government co-funded a workshop organised by the Institute for Advanced Studies which investigated the possibilities of managing the Scottish transition to a sustainable energy system. Another example is a DEFRA-commissioned SPRU report on the possibilities of fostering 'transformative innovation' (Scrase, Stirling et al. 2009).

However, the analysis presented above raises serious doubts about whether the application of the Dutch approach would be politically feasible in the UK given the existing institutional structures and dominant discourse commitments. How can such learning be achieved if policy initiatives do not travel easily because of different institutional and discursive commitments? From the analysis presented in this thesis a number of important observations can be raised:

- the active 'translation' of key ideas of a storyline into different social, cultural and political contexts is important[51];
- it is necessary to connect new ideas with established discourses;
- researchers with ambitions for acting as 'policy entrepreneurs' can facilitate policy learning across institutional contexts.

It is important to stress that policy learning is not a one-way street. The 'transitions' problem-framing which became dominant in the Netherlands is but one way to try to foster structural change in electricity systems. Based on a different discourse the UK Government implements a quite different approach. Dutch policy makers should also embrace some of the experiences made in the UK. The institutional context in the UK and the 'developing low carbon technologies' storylines led to an approach to fostering the transition to a low carbon economy that is, first, broader in the sense of simultaneously tackling the niche and regime level (whereas the Dutch energy transition has focussed too much on the niche level to date) and, second, more innovative in terms of funding vehicles. Third, overall funding for the transition is higher in the UK. So despite the rhetoric of 'managing a transition' in the Netherlands, it is in fact arguably the case that the UK is ahead of the game in some respects.

As a consequence this thesis recommends that both countries can learn from each other's experiences so far. Dutch policy makers can learn from the experience of the Carbon Trust

[51] This resonates with findings from the policy transfer literature which shows that lesson-drawing is "best considered as a creative act, rather than as a process of copying" (Rose 1991: 21). Dolowitz and Marsh distinguish between copying (direct and complete transfer), emulation (transfer of the ideas behind the policy), combinations (mixture of different policies) and inspiration (policy in another jurisdiction may inspire policy change but policy does not actually draw on original) (Dolowitz and Marsh 2000: 13).

with the introduction of more innovative funding vehicles, and could combine fostering niches with greening the regime, and should consider possibilities for increasing the budget of the Energy Transition. UK policy makers can learn from their Dutch counterparts about the value of visioning and backcasting exercises, about the open and strategic choice of technological pathways complementing expert analysis, and about institutional arrangements better able to facilitate policy coordination (such as the IPE in the energy transition) across the wide range of initiatives in the UK. Whereas the Dutch energy transition follows an explicit overall process architecture which includes strategic learning, the 'funding the best projects and firms' approach of the Carbon Trust is not an adequate strategy.

So what does all of this mean in terms of the possibilities for achieving sustainable electricity systems? Several concluding observations can be made. First, the two case studies show that promising and ambitious policy initiatives have emerged in both countries to explicitly tackle the challenge of transforming existing electricity systems. This is a sign for optimism. Second, there is no policy or institutional 'silver bullet' available to tackle this challenge as countries vary in their institutional settings as well as in their dominant discourses and interest constellations. Therefore there is no *one* 'right' way of framing the problem, which leads to a variety of policy initiatives with different outcomes. This diversity is helpful as it breeds innovation and provides ample scope for lesson-drawing in many directions (Rose 1991). An analysis such as the one presented above can increase the reflexivity of policy makers and stakeholders with regard to alternative framings of the policy problems and possible solutions. Third, coalitions of actors with the 'right' ideas can make a difference in bringing about policy and institutional change despite being constrained by existing discourses, interests and institutions.

7.3 The contribution of this thesis

The thesis makes three distinct contributions to knowledge:

1. From a political science perspective, a contribution has been made by showing how concepts from Hajer's discourse analysis framework can be fruitfully combined with Schmidt's discursive institutionalism framework in order to explain policy and institutional change by studying the interplay of discourses and institutions. The thesis confirms the ability of the framework to explain why the two governments have come to deal with the challenge of transforming electricity systems in quite different ways and how and why the analysed policy initiatives are being implemented in the ways they have been. However, the analysis also showed that processes of interest-based politics were important for explaining the policy processes. The analysis corroborated several of the discursive mechanisms identified by Hajer and Schmidt but also identified a mechanism neglected in this literature thus far. The thesis systematically grouped the mechanisms according to the way in which they influence policy processes. The evidence provided in this thesis adds weight to a recursive understanding of interests and ideas.

2. This thesis' starting point was the claim that the politics of governing 'system innovations' have so far received insufficient attention in the transitions literature; yet the thesis has shown that politics is fundamentally important in such processes. A contribution is made to the growing 'transition management' literature by shedding light on the politics of the adoption and implementation of transition management ideas into Dutch energy policy. The thesis also provides the first analysis of the emergence and implementation of a different approach to transforming electricity systems in the UK context, as institutionalised in the Carbon Trust. The contribution of this thesis has been to explain why and in which ways government attempts at steering 'system innovations' towards sustainability are politically challenging.

3. By highlighting the importance of the interaction between discourses, interests and existing institutions, the results provide an input to scholarly debate and policy making alike in ways that offer to help inform the rethinking of strategies for

fostering socio-technical change. A number of policy recommendations have been made.

The following section will outline potential avenues for future research and concludes this thesis.

7.4 Avenues for future research

There are a number of potentially fruitful avenues for further research building on the findings of this thesis. Three possibilities will be briefly discussed below.

The thesis focussed on two case studies. However, as the framework developed for the analysis is hoped to be broadly applicable, it would be interesting to look at other 'system innovation' policy initiatives in countries which also have ambitious, long-term carbon reduction goals such as Germany or Finland. To draw on a wider empirical base would allow a strengthening or modifying of the claims made in this thesis. As both the Netherlands and the UK are unitary countries, it would be particularly interesting to contrast these cases with an analysis of similar policy processes in a federal system such as Germany. As the communicative discourse was relatively weak in its influence on the policy initiatives in both of the cases studied here, it would be potentially fruitful to study initiatives in policy areas which attract wider public attention. In the context of 'system innovations' towards sustainable energy systems the policy controversies surrounding nuclear power as well as biofuels could provide this opportunity.

It has been argued that the discursive institutionalist approach was only partly able to account for the 'fine grain' of the institutionalisation of the storylines in the Energy Transition and the Carbon Trust. Further analysis in this respect could shift the focus onto bureaucratic politics. One hypothesis is that while storylines were important for the explanation of the emergence of the two policy initiatives, they become secondary compared to organisational self-interests in the institutionalisation of the storylines.

Instances like the struggle of the CT to prove itself against competitor organisations such as the EST, the TSB or ETI suggest that these processes play a role in determining the behaviour of organisations to some extent. Attending to bureaucratic politics, and shedding light on organisational factors and the motives of bureaucratic agencies, could therefore enhance the analysis presented here which has focussed on the overall political process. The public administration literature offers useful concepts for studying such phenomena. The classic model of bureaucratic politics was developed in the 1970s as a response to the conceptualisation of policy decisions as rational decisions by government as a unitary actor, which are then implemented by the administration (Allison and Halperin 1972). Allison and others suggested adjusting the conceptual lens to look at governmental decisions as the outcome of bargaining. Allison and Halperin object to using the term 'implementation' as it implies a too-simple understanding of 'carrying out' policies, which underplays a great number of lower-level decisions that shape policy practices. This understanding of the relationship between policy making and administering policy implementation breaks with the traditional model of administration. It assumed that there is "a strict separation between matters of policy, which are formally the province of politicians, and matters of administration, which are left to the public service" (Hughes 2003: 25). According to Allison and Halpering policy implementation cannot be seen as a separate, objective, politically neutral activity. Scholars in this field have widely studied how agencies use their professional expertise "to define or enhance issues through the interpretation of relevant information; to restrict or enhance the flow of information; or to cloud policy proposals with ambiguous information" in order to compete successfully with other agencies in the policy process (Ellison 2006: 1272). This conceptual lens is thus close to and compatible with the discursive institutional approach taken in this thesis. Understanding bureaucratic politics as agency competition can potentially provide further insights into the implementation of the Energy Transition and the Carbon Trust initiative.

Finally, a third potentially fruitful possibility for studying discursive politics in the context of 'system innovations' towards sustainability in the future is to utilise the approach developed in this thesis to pursue investigations into the directionality of innovation. This thesis has focussed on explaining policy processes. It would, however, also be highly

important to look at the choice of directions of innovation processes receiving support in the context of policies aimed at 'system innovations' and how this is shaped by processes of discursive politics. Stirling has convincingly argued that innovation needs to be thought of as a vector and not a scalar (2009). He points out that innovation has not only a scale and a time dimension (that is: how much innovation and at what pace?), but it also has a direction: supporting research, development and deployment of solar panels or carbon capture and storage (CCS) technologies are very different socio-technical pathways. These sets of technologies have very different implications for the future of electricity and in particular for the question of whether future electricity systems will rely on small-scale, decentralised or large-scale, centralised provision of power. CCS and nuclear power are for instance appealing for actors who are part of the existing electricity regime, because they do not disrupt the current socio-technical structure of electricity provision relying on large-scale, centralised provision of power (Scrase and Smith 2009). As transitions are open-ended processes and a multitude of sustainable electricity futures are conceivable, how and why do policy initiatives come to support some pathways over others? Partly this will have to do with technological and economic considerations, but Stirling argues that a multiplicity of technically-feasible and potentially economically-viable options exist in this space (Stirling 2009). So, again, it is sensible to assume that because of uncertainty and disagreement about the future technical feasibility and economic potential – as well as the social desirability – of any of these options, processes of discursive politics will also play an important role in selecting the most promising pathways.

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9 Appendices

Appendix A:

List of interviews conducted for the Dutch case study:

Position of interviewee	***Interview date***	***Interviewee code***
Policy advisor from the Ministry of Economic Affairs	16.01.06	1
Researcher I	14.02.06	2
Researcher II	14.02.06	3
Researcher III	14.02.06	4
Member of the Taskforce Energy Transition	15.02.06	5
Platform secretary	16.02.06	6
Representative from Competence Centre Transitions	16.02.06	7
NGO member of a platform	17.02.06	8
Representative from Innovation Network Agriculture	17.02.06	9
Researcher IV	21.02.06	10
Business representative, ex-member of platform	21.02.06	11
Policy advisor from the Ministry of Economic Affairs	22.02.06	12
Representative from an environmental NGO	23.02.06	13
Business representative, member of platform	27.02.06	14
Policy Advisor from the Ministry of Economic Affairs	28.02.06	15
Business representative, member of platform	01.03.06	16
Researcher V	06.03.06	17
Researcher VI	14.03.06	18
Researcher VII	07.03.06	19
Researcher VIII	24.05.06	20
Researcher IX	10.03.06	21
Business representative, ex-member of platform	04.04.06	22
Researcher X	15.03.06	23
Policy advisor from the Ministry of Housing, Spatial Planning and the Environment	28.02.06	24
Representative from Competence Centre Transitions	16.02.06	25
Energy Consultant I	10.03.06	26
Energy Consultant II	10.03.06	27

List of interviews conducted for the UK case study:

Position of interviewee	*Interview date*	*Interviewee code*
Policy advisor of business association	19.10.07	1
Member of senior management of Carbon Trust	16.01.08	2
Former senior civil servant at DETR (DEFRA)	13.03.08	3
Senior civil servant at DBERR	08.02.08	4
Member of Carbon Trust steering board	08.02.08	5
Head of Policy of environmental organisation	03.03.08	6
Former senior civil servant at DETR	06.03.08	7
Former ACBE member	31.01.08	8
Senior researcher	05.02.08	9
Senior civil servant at DBERR	08.02.08	10
Member of the Carbon Trust board	12.02.08	11
Senior civil servant, DEFRA	14.02.08	12
Civil servant, DEFRA	14.02.08	13
Representative of alternative technology organisation	05.02.08	14
Representative of business association	11.02.08	15
Managing Director of marine device developer	18.02.08	16
Senior management, Carbon Trust	19.02.08	17
Technology manager, Carbon Trust	19.02.08	18
Senior civil servant, DBERR	13.02.08	19
Senior researcher	28.02.08	20
Lecturer in renewable energy policy	22.02.08	21
Business member of Carbon Trust board	03.03.08	22
Senior management, Carbon Trust	05.03.08	23
Senior management, UKERC	12.03.08	24
Professor for Energy Policy	17.03.08	25
Former senior management, Carbon Trust	10.03.08	26

Appendix B:

Example of interview schedule

Interview with XXX, member of the Carbon Trust board

Intro

- Thank him for his time – remind him, is it OK that we talk for no more than one hour?
- Explain aim of my PhD project (explain energy innovation policy to support sustainable energy systems) and purpose of interview (explore why CT was set up, learn about 'first hand' experiences of how it works; your view on its role in the

context of all the other government initiatives and its achievements and problems so far in promoting low carbon technologies, etc.)
- Ask if recording is ok?
- Ask him if he has any questions before we start.

Main themes to discuss

Process of setting up the CT:
- Why was it deemed necessary/important? Why new institution? Which 'void' did it fill? Why form of company? What is its main role? Why independent from government/EST? What can it do better than government or other existing bodies at that time (given complaints about too many new initiatives)? Why was it considered "ground breaking" by Ms Hewitt?

He was Chairman of the ACBE Climate Change Working Group: what role did ACBE play?
- What impact did they have on the way the CT was set up? Did the Government listen to the two reports it published? Did the original idea of a Carbon Trust come from ACBE? How independent is the CT from the Government? This was one of the main concerns of the second report (independent from changing governments, independent to make sure the benefits go back to business paying the levy; maximise business influence).

What has changed through the CT in the area of low carbon energy policy (innovation, technology)?
- Impacts on energy policy; areas not affected? How does this happen in practice? Examples of when this has happened? Influence on renewables policy?; wider energy policy? Did the CT change the way the ministries and different groups within government work together? What role does the Carbon Trust play in advising the government on policy issues? What is its influence in this respect? How does it consider wider socio-economic factors which hinder the move towards a low carbon economy? Influence on practices, investment decisions by companies?

Crowded context: how the Carbon Trust works together with government departments, the EST, the TSB, the ETI, etc; how are priorities coordinated? What is the division of labour?

Governance of the CT: role of board?
- How far are they involved in strategic direction CT is taking? Setting of priorities (based on which criteria are technology areas chosen? How does it work? How often do they meet?)

How the Carbon Trusts engages with other stakeholders (beyond businesses and government as was initially thought to do)?
- (Some decisions might be political: biomass: first or second generation, sustainability etc., why not environmental groups involved?); does it publish its

strategic framework for public consultation (as suggested when CT was set up)?; are there any stakeholder advisory groups?

Your personal view on:

- What are the main achievements and challenges of the work of the Carbon Trust so far? [Mention some criticisms of other people: BCC critique: neglects SMEs, too difficult to get info; focus on carbon as single success criteria (biofuels debate?); focus on technology fix?; focus on cost effectiveness and commercial gain like venture capital?; cannot address the valley of death, innovation gap?; business matters, other stakeholders neglected? National audit office: impact low? Focus on supply and large user-demand while separating the households?]

If time allows:

- Why did the Carbon Trust happen in the UK? Why not in the Netherlands, Germany? Same problems everywhere, only in UK this kind of institution: cultural dimension?

De-briefing

- Mention some of the main points learned, interviewee might want to comment on this feedback;
- Say ‘have no further questions’, ask if the interviewee has any questions or ‘do you have anything else you want to bring up before we finish?’;
- Are there any important points which you think I have missed or should know?;
- Recommendation for other potential interviewees?